

1. That reliable measures of the extent of changes in business practices in the drug field in Pennsylvania as occasioned by the Fair Trade Law are not obtainable at the present time.

2. That for the most part druggists' bookkeeping systems are inadequate for obtaining such measures.

3. That most druggists seem to expect an increase in business rather than an improvement in the character of the business already being done. This may be due to the emphasis on the importance of volume in the minds of business men. Nearly all of the druggists interviewed spoke of increasing their net profit through "increasing their business" but seemed to overlook the fact that the net profit may be increased by doing the same amount of business more efficiently. Increased volume will make up for some inefficiency, but the best combination is to have volume and have that volume handled with efficiency.

4. That there is an intimation that some underlying changes may be slowly developing momentum, such as the predictions that the introduction of new products will increase, that small manufacturers and small retailers will have more equal footing with their large competitors, that business will return to the traditional manufacturer to wholesaler to retailer method of distribution, or that the concentration of retailers into chains will be lessened. These will probably not become demonstrable until the present confused and constantly changing Fair Trade picture becomes more clearly settled.

A CHRONOLOGY OF SOME EVENTS OF PHARMACEUTICAL INTEREST IN ANCIENT CHINA AND JAPAN.*

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This paper is offered with a view to increasing the interest in things Oriental. Presentations at the meetings of the Historical Section of this ASSOCIATION and other similar bodies usually ignore the possibilities of historio-scientific research in the Orient, especially China and Japan. Many who lack the library facilities or linguistic training necessary to this sort of research nevertheless find the results fascinating reading.

Chinese and Japanese science offer some chronological difficulties, though the former is probably reliable except for the Pre-Hellenic period. The Chinese fondness for literary catalogs and dynastic histories has served to preserve much of the information now available. At the same time, however, it must be stated that much of the ancient literature has never been translated. Most of the translations to date have been made by people not particularly interested in Pharmacy or any other science.

In the material to follow, it should be remembered that the earliest characters are probably legendary. For this reason, the first three dates are only approximations. Other dates about which there seems to be some doubt have been indicated by a "c," or by a parenthetical question mark. It will be noted that there is no

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uniformity of method for giving dates. This is due to the fact that what seemed to be the most certain dates in connection with any individual or period have been chosen.

It should be understood, of course, that no pretense of completeness is made for this paper. It simply recounts a few random events in a long and interesting history.

PRE-CHRISTIAN ERA.

- ?-2838. Reign of the legendary emperor Fu Hsi (also called Tien Huang Shih). He is considered the inventor of the "pa kua," or "Eight Trigrams." For this reason, he is regarded as the chief god of medicine, since Chinese physicians influence the minds and maladies of their patients by the mystical power of the "pa kua." Fu Hsi and his four successors were supposed to have reigned an average of 85 years each.
- 2838-2698. Reign of the legendary emperor and "Divine Husbandman," Shen-nung. He is the supposed author of the "Pen-tsao," which contained 365 drugs for various diseases and ailments. For this reason he is also considered a god of medicine.
- 2698-2598. Reign of the legendary Yellow Emperor Huang Ti. The "Huang Ti Nei-ching Su-wen," or "The Simple Questions of Huang Ti," is traditionally ascribed to him. This work is written in the form of a dialogue between the supposed author and the court scientist. It gives the oldest Chinese views on physiology and pathology. In its present form, the book is probably not older than the fourth century B.C. This work contains a sentence which points to the circulation of the blood: "All the blood is under the jurisdiction of the heart."
- c. 1800. Time of I Yin, who is supposed to have originated medical decoctions.
- 604-c. 510. Life of Lao Tzu, supposed author of the "Tao te ching," the "Canon or Classic on Reason and Virtue," and the founder of Taoism. This philosophy is of interest because it is the fountain-head of Chinese mysticism. The Taoists were deeply interested in alchemy. In the past, many of them spent their best years searching for the elixir of life and the pills of immortality.
- 450-400 (?). Time of Pien Chiao (nickname of Chin Yueh Jen), semi-mythical Chinese physician. He is credited with the authorship of one of the earliest and most popular Chinese medical works. It is called the "Nan ching," and contains 81 chapters. Some authors have credited him with the Chinese theory of the pulse. One writer says he invented the narcotic wine, here ascribed to Hua To (q. v.). The same authority therefore calls him the "Father of Narcosis."
- 221-210. Reign of Shih Huang-ti in China. He sent expeditions to the island of Peng-lai in the Eastern seas in order to obtain the herb of immortality. In this latter effort, he was influenced by Lu Sheng, an alchemist.
216. Birth of Shun Yu-i, Chinese physician. His medical disciples compiled many of his writings, but the original is now lost.
213. Date of the famous "Burning of the Books" episode. This was carried out by order of Shih Huang-ti, but it should be noted that books on medicine were among those exempted.
189. Death of Chang Liang, Chinese alchemist. His efforts to find the elixir of immortality led him to employ fasting, hygienic living and spiritual exercises, as well as various drugs.
- c. 150 (?). Time of An Chi-sheng, Chinese druggist, who is said to have succeeded in compounding the pills of immortality. Unfortunately, however, he ascended into heaven from a mountain top and took the secret with him.
- c. 145-c. 86. Life of Ssuma Chien, Chinese historian. His famous "Historical Memoirs," written about 122 B. C., records the story of a man who persuaded the emperor that gold could be made of cinnabar.
- 140-85. Life of emperor Wu (Han dynasty), the patron of alchemy. His friend and adviser was probably Li Shao-chun. The latter was an apprentice of An Chi-sheng.
- Alchemy is said to have been introduced into China from Greece, *via* Bactria, during the second century B.C. A few authors, however, believe that alchemy originated slightly earlier in China, and was carried West by the influence of the emperor Wu.

122. Death of Huai Nan Tzu, Chinese alchemist. His "Hung Lieh Chich" is a treatise on cosmology embodying alchemical doctrines. This is a part of the Taoist lore. It is likely that he was the prince who supposedly discovered the elixir of life (Taoist legend).

THE CHRISTIAN ERA.

The Chinese are said to have begun the practice of dyeing the hair about the beginning of this era.

7. Wang Mang orders the court physicians to study human anatomy. This does not seem to have been enforced a very long time.
22. Death of Liu Hsin, Chinese scholar and astronomer. He wrote a chronology of very scientific appearance for prehistoric China. It was worthless, but readily accepted.
92. Death of Pan Ku, author of a famous cosmogonical treatise entitled "Pai hu ting." The work contains many strange notions on physiology.
142. Writing of Wei Po-yang's "Ts'an T'ung Ch'i," earliest Chinese treatise on alchemy. It is really a discourse on the preparation of the Pill of Immortality.
- c. 150-200 (?). Life of Chang Chung-ching, greatest Chinese physician of his time. His "Chin kuei" was a treatise on dietetics, which enumerated many plants. His "Shang-han-lun," on fevers, was probably more popular. It contained over 100 prescriptions.
- c. 190-265. Life of Hua To, famous Chinese surgeon. He is the supposed author of the "Chung-tsang-ching," an important medical work which includes many chapters on the Pulse, Physiology and Pathology. He is said to have produced general anesthesia by means of a wine called "ma-fei-san" or "ma-yao." Its composition is unknown, although some authors believe it contained hashish.
- 250-300. It is believed by many scholars that an investigation of the Taoist writings of this period would shed some light on early Chinese alchemy.
- c. 215-282. Life of Huang Fu, Chinese physician. He was the author of a treatise on acupuncture called "Chia-i-ching." This work, which contained 128 chapters, seems to have been the basis for all later works on the subject.
- 223-262. Life of Chi Kang, Taoist philosopher and alchemist. He was one of the "Seven Sages of the Bamboo Grove."
- 233-297. Life of Chen Shou, Chinese historian. He edited the official history of the Three Kingdoms, which work contained the first mention of tea.
- 265-317 (?). Life of Wang Shu-ho, Chinese physician and author of a famous book on the pulse entitled "Mo Ching."
- c. 281-361. Life of Ko Hung, Chinese Taoist, alchemist and physician. He wrote two medical works, and a treatise on Taoist alchemy, dietetics and magic. He seems to have made alchemical experiments requiring cinnabar.
- 290-307 (?). Publication of the "Nan fang tsao mu chang," by Chi Han. This was the earliest Chinese work of a purely botanical character. It described 80 species of plants in southern China.
- 399-410. Time of Fa Hsien's remarkable travels. The account of his trip has much valuable information on plants, chandalas (lepers ?) and free hospitals.
414. Korean physician Kon Bu sent to Japan to cure the emperor Ingyo. He represents one of the earliest links between Chinese and Japanese civilizations.
468. Korean physician Takurai sent to Japan. He settled in Naniwa, and his descendants continued the practice of medicine.
- 451-536. Life of Tao Hung-ching, Chinese Taoist physician and alchemist. He was the author, or editor, of the "Ming-i-pieh-lu" (sometimes called "Pieh-lu"), which was one of the most important ancient works on materia medica. It described double the number of drugs listed in the Pen-tsao. Among his other medical writings was the "Pen-tsao ching-chu," also on materia medica.
- c. 588-592. Scales and tiles are imported into Japan from China.
554. The physician Oyu-Ryoda, and the pharmacists Han-Ryoho and Tei-Yuda go to Japan from Korea, taking various native drugs with them. This marked the real beginning of a period of Korean influence on Japanese medicine.
562. Probable date of the importation of the first Chinese medical books into Japan. It is said there were 29 works in the group, including those of Chang Chung-ching (q. v.).

- 597-649. Life of Tai Tsung (or Li Shih-min), second Tang emperor and real founder of the dynasty. He patronized art and learning. His library at Si-an-fu contained 200,000 volumes.
- c.* 607. Chao Yuan-fang composes a treatise which describes many diseases. It consisted of 50 parts and dealt with such varied subjects as scabies, female complaints and teeth.
- c.* 608. Korean bonze Kwanroku goes to Japan to further the advance of medicine there. Soon after some Japanese students were sent to China to obtain more medical knowledge.
- c.* 627. It is said that the use of thyroid gland for goiter is recorded in the Chinese medical literature under this date. However, no attention seems to have been paid to the discovery.
- c.* 650. The Tang emperor, Kao Tsung, orders a revision of the Pen-tsoo, which work was directed by Li-chi (or Ying Kung). A little later, a new revision was edited by Su Kung (or Su-ching). The subject matter of the latter work was arranged under the headings: minerals, man, quadrupeds, birds, insects, fishes, cereals, vegetables, fruits, trees, herbs and natural objects used in medicine.
682. Death of Sun Ssu-mo, author of many Taoist medical works. Probably the most important are the "Chien-chin-fang," and the "Yin-hai-ching-wei." The former is an immense collection of recipes, including a description of the "Ulcers of Jealousy," which some authors believe may have referred to soft chancre. The latter book is a treatise on eye diseases.
- 685-762. Life of Ming Huang (or Li Lung-chi), sixth emperor of the Tang dynasty. He founded the Imperial Academy, which was given charge of the scientific undertakings of the empire.
- 724-748. Reign of the Japanese emperor Shomu-tenno, during which time the first public drug store was established in Japan.
752. Publication of Wang Tao's medical work entitled "Important Secrets of the Outer Terrace." It was very elaborate, even including a brief summary of the veterinary art.
758. Founding at Nara of the earliest Japanese hospital of any importance.
761. Publication of Wang Ping's commentary on Huang Ti's "Simple Questions." This was the earliest of the many critiques on that book.
- 775-800 (?). Period of greatest activity of Wake Hiroyo, Japanese physician and educator. His "Yakkei-taiso," in two volumes, was an important work on materia medica. It was based on the Pen-tsoo of Su-ching. This new volume, however, contained only 254 drugs.
- 785-860. Life of Hiroizumi Monobe, Japanese physician and author of the earliest Japanese treatise on hygiene, the "Setsuyo-yoketsu." It is said to have consisted of 20 volumes.
812. Death of Tu Yu, Chinese writer. His encyclopedic work on these subjects devotes one section to "food and goods."
- c.* 834-848. Publication of the "Chi-so-ki," by Fukuyoshi Omura. It is the earliest Japanese treatise on surgery, but is purely Chinese in its derivation.
- c.* 982. Compilation of the "Ishinbo," by Yasuyori Tamba. This is the oldest Japanese medical work now extant in its original form. It is derived from several Chinese works. Some authors ascribe another work on materia medica to Yasuyori.
- c.* 1000-1050. Time of Tou Ping, Chinese chemist. He is noted for his "Chiu Pu," a work on spiritous liquors which is said to describe distillation.
1027. Wang Wei-te makes two copper figures of the body to illustrate the art of acupuncture. Three hundred sixty-seven places were indicated. He also wrote on this subject. It is said that prophylactic inoculation was practiced in China as early as the eleventh century. The method probably originated in India.
- 1030-1093. Life of Shen Kua, Chinese author, mathematician, astronomer and instrument maker. He wrote the "Su-shen liang-fang," a work on medicine.
- c.* 1090. Publication of Pang An-shih's work on fevers. His pupil, Tung Ping, added a glossary and an appendix to this book.
- c.* 1093. Publication of Chien-i's book on children's diseases.

Other Chinese writers of this period described various plants and animals. Some of these works might be of interest to the pharmaceutical historian.

The bibliography which follows lists the quite common sources of material used, all of which might be found in any college library.

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PASTES. I. FOR DERMATOLOGIC USE.*

PRELIMINARY REPORT.

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We propose that the term "paste" be defined as a "water-soluble gel for medical use." This definition is intended to include semi-solid preparations of various degrees of consistency as required by their respective uses. If this definition of "paste" be accepted, then the title of Paste of Zinc Oxide and other "pastes" of fatty nature would have to be changed. Even if we had no other class of preparations for which this term is so much more appropriate as to make this change of meaning mandatory, the change would be desirable as there is no justification from the standpoint of etymology or even common use of the word for applying it to salves. The word is derived from the Greek meaning "barley porridge," possibly originally a salted mess of food. It is defined in the Century Dictionary as a compound in which a sufficient amount of moisture is present to "make a mass without liquefying." We, therefore, advocate that the present official use of the term "pastes" be abolished and that some other term such as "dense ointment" be substituted for those preparations to which the former term is at present applied. Thus, *e. g.*, the official title of *Pasta Zinci Oxidi* might be changed to "*Unguentum Zinci Oxidi Densior*" and that of the *Pasta Zinci Oxidi Mollis* be changed to "*Unguentum Zinci Oxidi Mollis*."

We believe that the clinical value of pastes in the sense in which we shall use the term here has not been adequately appreciated and for this reason we have devoted the last several years to a study of their pharmaceutic and clinical possibilities.

Owing to the importance of being able to specify a definite consistency for pastes, which needs to vary in accordance with different uses, we have spent a good deal of time in attempting to secure a simple method of standardizing paste

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