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THE OLDEST PAVED ROAD FAIYUM DEPRESSION, EGYPT

By

Thomas M. Bown and James A. Harrell

About the Authors: *Thomas Bown* grew up in Iowa and graduated from Iowa State University where he studied earth science and ancient history. Bown received his Ph.D. in geology at the University of Wyoming in 1977. He served as expedition geologist for the Duke University/Cairo Geological Museum Paleontological Expeditions to the Faiyum Depression for 14 years, and has research projects in Utah, Wyoming, Egypt, Ethiopia, Argentina, and Uruguay. He is now employed at the U.S. Geological Survey in Denver where he is a specialist in mammal evolution, paleosols, and trace fossils of social insects.

James Harrell is originally from southern California where he earned his B.A. in earth sciences from California State University in Fullerton. He went on to receive his M.S. in geology at the University of Oklahoma and, in 1983, his Ph.D. in geology at the University of Cincinnati. Since then he has been a geology professor at the University of Toledo specializing in sedimentary petrology, archeological geology, geologic hazards, and geostatistics. For the last six years he has been doing field research in Egypt on the sources and varieties of stone used in ancient Egyptian sculptures and monuments.

Thirteen segments of an ancient stone-paved road are preserved in the desert of the northern Faiyum Depression of Egypt. Although part of the road was known as early as 1905, it has been largely ignored since then and its significance has gone unrecognized. This article focuses on the distribution, preservation, construction, use, and antiquity of the road. More detailed treatment of these topics, as well as the basalt quarries, quarrymen's camp, quay, and other associated sites, is presented elsewhere (Harrell and Bown).

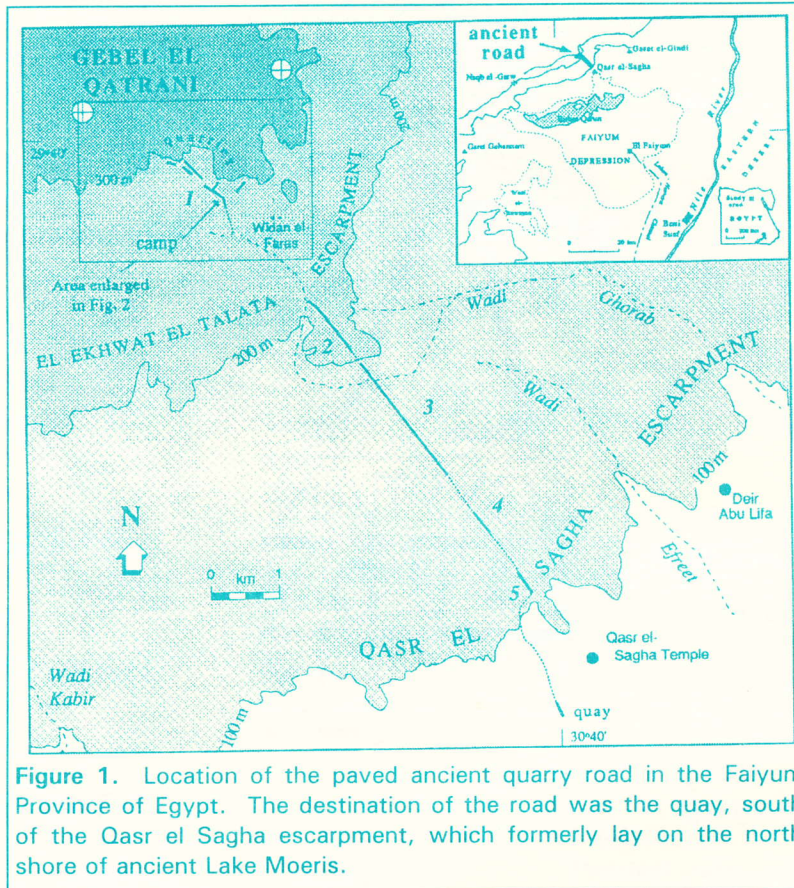


Figure 1. Location of the paved ancient quarry road in the Faiyum Province of Egypt. The destination of the road was the quay, south of the Qasr el Sagha escarpment, which formerly lay on the north shore of ancient Lake Moeris.

Earlier Investigations:

In 1905, pioneer Faiyum geologist, H. J. L. Beadnell, recorded the approximate position of a 4.2 kilometer-long "ancient quarry road" on a map accompanying his report on the geology of the Faiyum Province of Egypt (Fig. 1, segments 3-5). His text made no mention of the road, but it is clear from the designation on his map that Beadnell presumed that it led to then undiscovered quarries in basalt capping Gebel el Qatrani, the high escarpment bordering

the northern part of the Faiyum Depression. In classic studies of the prehistory and geology of the northern Faiyum, Caton-Thompson and Gardner added another 0.6 km to the known length of the road (Fig. 1, segment 2), although the bearing and location of this road segment on their map departs significantly from its true course. They suggested that the objective of the ancient basalt workers was not quarrying, but rather collecting loose blocks of basalt found on the scree slopes of Gebel el Qatrani. Although Caton-Thompson and Gardner briefly described the road, neither they nor Beadnell were aware of its true age, and as late as 1991 the road was thought to be a Middle Kingdom

[Ed. Note: 1 km = 0.6 mi. 1 m = 3.3 ft.
1 cm = 0.4 in. 1 kg = 2.2 lbs.]

construction because of its close geographic association with the 12th Dynasty Qasr el Sagha temple (Kemp, Arnold).

New Discoveries: During reconnaissance geologic fieldwork on Gebel el Qatrani in 1987 by Bown, two new paved road segments and the smaller basalt quarry (with about 1,200 cubic meters of rock removed) were discovered (Fig. 2). Seven additional paved road segments, one unpaved segment, the larger (east) basalt quarry (with more than 40,000 cubic meters of rock removed), and the remains of the quarrymen's camp were located by Harrell and Bown in 1993. The new additions to the quarry road (the first since the study of Caton-Thompson and Gardner) collectively total more than 1.4 km of paved reaches and at least 0.28 km of unpaved road.

Distribution and Preservation:

The ancient road trends northwest, between 320° and 350°. It has a cumulative length of about 11.7 km and spans the shortest distance between the basalt outcrop on Gebel el Qatrani and the northern shore of ancient Lake Moeris. This length includes 13 segments (Fig. 1 segments 2-5; Fig. 2; segments 1a-1i) in which 4.47 km of pavement is preserved; one 0.28 km segment (Fig. 2; 1j) that was never paved; and several intervening stretches of about 6.77 km where the road has been obliterated by erosion (Figs. 1&2). Of the paved segments (Fig. 3), seven (0.87 km) were surfaced with fragments of basalt, and six (3.6 km) were paved with sandstone or coquinoïd [consisting of cemented coarse shell designs] limestone flags (Figs. 1-3). The unpaved segment (Fig. 2) is a simple path, 2.0-2.2 m wide, from which all pebbles and

larger rock fragments have been swept to the side.

From the basalt quarries to the quay on Lake Moeris over nine km away, the road descends 140 m in elevation but locally rises in elevation as it passes across the northwest-dipping (at up to 4°) cuesta slopes of the el Ekhwat el Talata and Qasr el Sagha escarpments.

Construction: The volume of paving material used in building the road is about 8,000-8,500 cubic meters. Combined with the total amount of basalt removed from both quarries (about 41,200 cubic meters), the road construction and the operation of the quarries resulted in the ac-

quisition and transportation of approximately 50,000 cubic meters (about 1.5 x 10⁸ kilograms) of rock.

The type of material used in road construction was determined by the closest outcrop of suitable rock. In areas close to Gebel el Qatrani, this was basalt

taken from scree slopes or desert outwash flats. Farther away from the escarpment, slabs of calcite-cemented sandstone and coquinoïd limestone were pulled up and carried to the road site (sometimes from distances of more than a kilometer). Logs of silicified wood are common locally where the road passes over upper Eocene rocks on the cuesta below the el Ekhwat el Talata Escarpment (Bown and Kraus), and this material was used for about 70 m of road segment 3 (Fig. 3b). The basalt pieces are irregular fragments with maximum dimensions of about 25-50 cm. Sandstone slabs about 5-20 cm thick and 0.3-1.0 m in diameter were preferred in building the flagstone portion of the road.

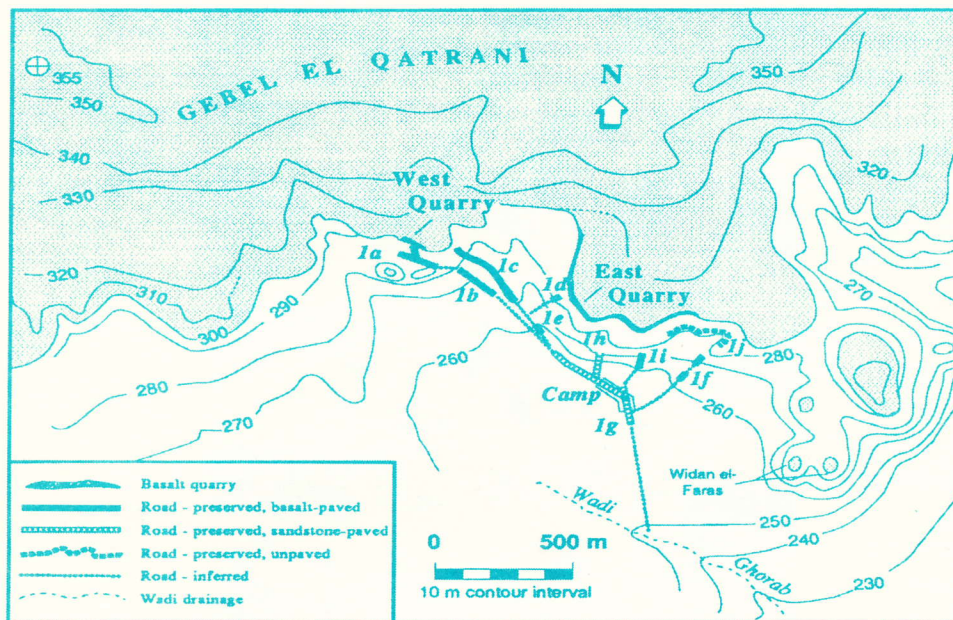


Figure 2. Detail of the Gebel el Qatrani escarpment showing the branches of road segment 1, the west and east basalt quarries, and the quarrymen's camp discovered by the authors between 1987-1993.

The best preserved parts of the road surface have a remarkably uniform width of 2.0-2.2 m (2.1 m = 4 ancient Egyptian cubits). Rock pieces were laid tightly together in one layer on the natural sandy surface of the desert without benefit of a roadbed. Larger slabs of rock were generally utilized to border the margins of the road, and these were placed with a straight edge to the outside to maintain parallel road margins (Fig. 3a). Although it appears that some effort was made to seek out and join rocks with more-or-less naturally fitting margins, there is no evidence that any stones were shaped prior to being set in place. Evidence is also lacking as to whether gaps between the slabs were filled with mud or other mortar. Neither is likely to have survived several millennia of deflation.

Use: The ancient road was clearly built to facilitate the transport of basalt from the quarries to a basalt-surfaced quay on Lake Moeris where the blocks were loaded onto barges. Most of this lake has since dried up. The modern remnant, now by Birket Qarun, lies 65 m below and 8 km south of the quay. The largest surviving transported block (more than 1 cubic meter and weighing more than 3,000 kg) lies on the quay. The paving stones show no signs of grooving or breakage such as would be expected if sledges had been used. This suggests the

possibility that the sledges were pulled over wooden planks that were laid across the road and advanced with the sledge. A similar technique was employed for construction ramps associated with some Middle Kingdom pyramids (Kemp). With the use of planks, the flag-stone pavement would show neither wear nor breakage by the weight of the laden sledge.

Age: Mud-brick streets were in use in Sumerian and Indus cities at least as early as 2500 BCE (Forbes); however, credit for constructing the oldest flagstone roads has traditionally been given to the Minoans (Forbes, Pendlebury, Lay). These people built extensive networks of extra-urban "high-ways" connecting several Cretan towns and ports; and a sophisticated paved road of dressed stones survives near their capital of Knossos. At the earliest, the Minoan road is contemporaneous with the Egyptian 11th Dynasty (about 2040-1640 BCE). It appears to be of about the same antiquity as the Mycenaean polygonal slab roads on Skyros (about 2100 to 1600 BCE; see Forbes, Merdinger, Casson). Pottery fragments in the basalt quarries and on the quay date the Faiyum quarry road to the Old Kingdom (Jones) and particularly to the Fifth and

Sixth Dynasties (2465-2134 BCE; Baines and Malek). The Faiyum road is, therefore, the oldest known surviving flagstone-paved road in the world and predates those on Crete and Skyros by possibly as much as 500 years.

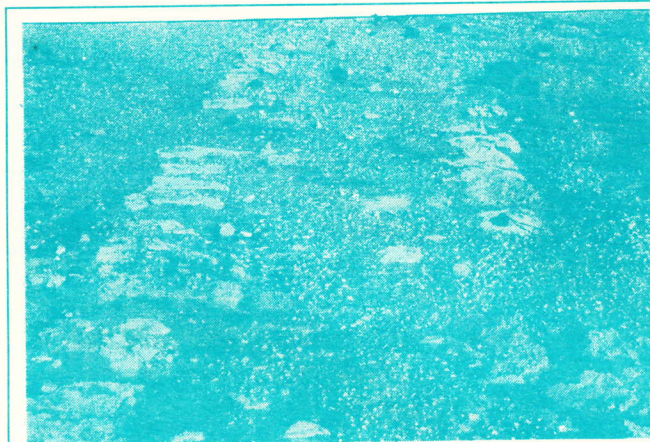


Figure 3a. Section of well-preserved flagstone road along the southern part of road segment 1g, just south of the quarrymen's camp (Fig. 2). Note the remarkably uniform width of road (2.1 m at surveying compass) and the straight margins.

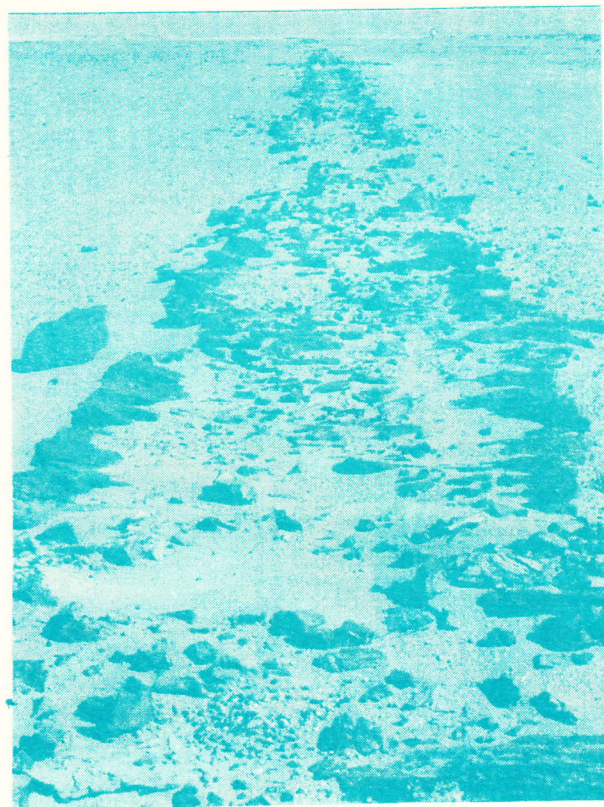


Figure 3b. Logs of silicified wood making up about 70 m of ancient quarry road near the middle of road segment 3 (Fig. 1). The road varies between 2.0-2.2 m in width. View to southeast.

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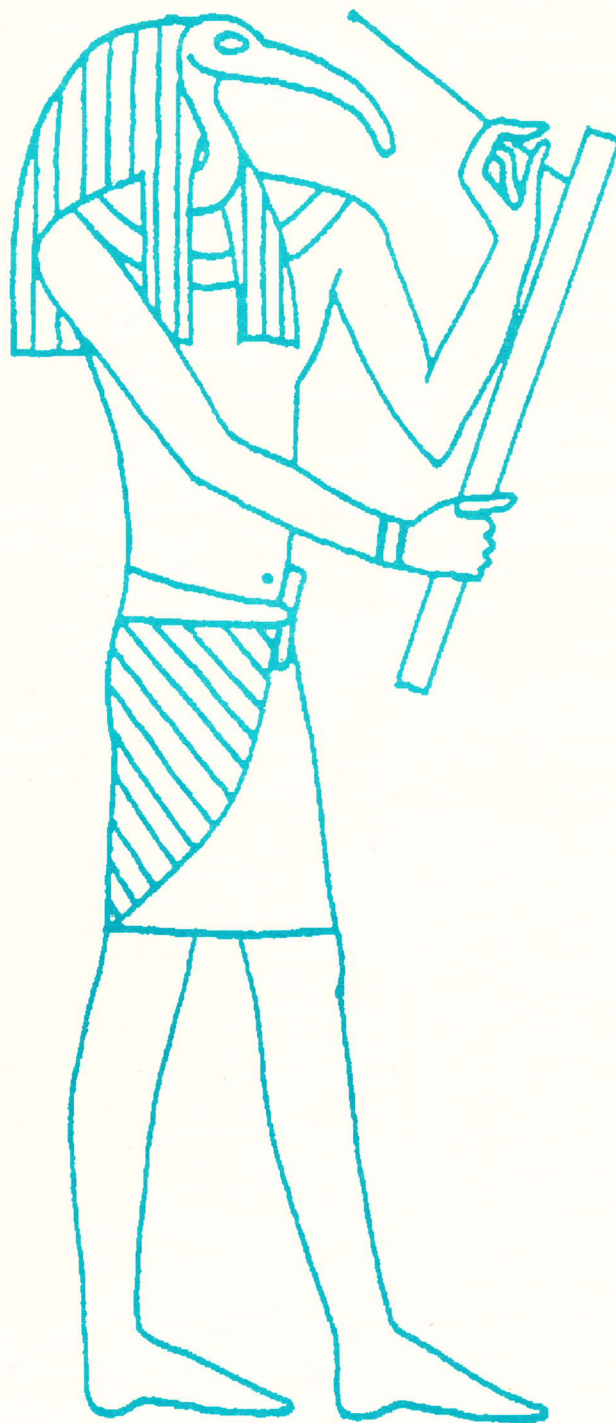
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THE IMPACT OF GEOGRAPHY ON ANCIENT EGYPTIAN HISTORY

By Tim Pepper

About the Author: Tim Pepper, a senior at Fairview High School in Boulder, visited Egypt in 1991 with the Pyramid Study Group. This article was originally written for National History Day, 1994, where it placed second in the State of Colorado, and earned him a trip to Washington DC for the national competition. It received a special recognition award from the Arab World And Islamic Resources League. Tim also wrote another article for The Ostrakon, about Nile River Pollution (May, 1992).

Although the Greek historian Herodotus said Egypt was "the gift of the river," other factors, such as the surrounding deserts and the Nile Delta, significantly influenced ancient Egyptian history and substantially contributed to that civilization's early development. It will be shown that Egyptian commerce, culture, religion, architecture, and even national unity were all heavily influenced by its geography.

To gauge the impact of geography on the civilization of ancient Egypt, it is necessary to understand how the land's topography evolved. Egypt is commonly pictured as a dry and sandy desert with the ribbon of the Nile running through it, but this was not always so. As recently as 50 million years ago, all of Egypt up to modern-day Luxor was submerged under the waters of the Mediterranean Sea (Murnane, p.15). However, about 40 million years ago, during the Eocene

Period, the land tilted slightly, allowing the ancient bay to drain. Unlike today, water drainage off the African highlands at that time was neither seasonal nor the only source of moisture to the land, for Egypt still received frequent rainfall (Butzer 1964, p.302).

Gradually, during the Miocene Epoch (24 million to 5 million years ago), vertical erosion on the Egyptian plain, in addition to a further rise in the level of the land, formed an enormous gorge, between six and nine miles wide, which confined the Nile to approximately its present course (Murnane, p. 16). During the Pleistocene (2.5 million to 16,000 years ago), masses of loose debris were deposited by the river, forming terraces on top of the harder deposits on the sides of the gorge (Butzer 1964, p.180).

Thirty-thousand years ago the main tributary of the Egyptian Nile, the White Nile, had not yet

joined with the Blue Nile or the River Atbara. While the White Nile, which originates from Central Africa, contributes the most constant and steady flow, the Blue Nile and River Atbara carry seasonal runoff water from the rains on the Ethiopian plateau. Between 25 and 30 thousand years ago, the chan-

nels connecting the main Nile to the Ethiopian rivers were formed. As a result, the Egyptian Nile flooded annually, leaving a new deposit of fertile topsoil which became the foundation for Egypt's later agricultural success. The addition of the annual Ethiopian orographic [from mountains] runoff, coupled with a coinciding drop in rainfall, made the Nile the prime source of water for Neolithic Egypt (Murnane, p.18).

EGYPTIAN TIME FRAME

| YEARS BEFORE PRESENT | GEOLOGICAL EPOCH | CULTURAL ERA | DYNASTY NUMBER | DATE (circa) | HISTORICAL PERIOD |
|----------------------|------------------|--------------|----------------|--------------|----------------------|
| 58 million | Eocene | | | | |
| 37 million | Oligocene | | | | |
| 24 million | Miocene | | | | |
| 5 million | Pliocene | | | | |
| 2 million | Pleistocene | | | | |
| | | | | | |
| 700,000 | | Paleolithic | | | |
| 10,000 | Holocene | Neolithic | | | |
| 6,000 | | Predynastic | | | |
| | | | | | |
| | | Dynastic | I | 3150 BCE | Archaic |
| | | | III | 2686 BCE | Old Kingdom |
| | | | VII | 2181 BCE | 1st Intermediate Pd. |
| | | | XII | 2040 BCE | Middle Kingdom |
| | | | XIII | 1782 BCE | 2nd Intermediate Pd. |
| | | | XVIII | 1570 BCE | New Kingdom |
| | | | XXI | 1069 BCE | 3rd Intermediate Pd. |
| | | | XXVII | 525 BCE | Late Period |
| | | | | | |
| | | Greek | | 332 BCE | |
| | | Roman | | 30 BCE | |
| | | Byzantine | | AD 323 | |
| | | Islamic | | AD 642 | |

Sources: Murnane, Hoffman, **WORLD BOOK**

By the beginning of the Old Kingdom (c.2686 BCE), ancient Egypt was in fundamentally the same geological state as today's modern Egypt. Since that time, the course of the Nile has gradually migrated eastward, leaving alluvial deposits on the western side of the Nile valley (Figure 1a, a cross-sectional view of the Nile Valley).

Ancient Egyptians called their country *Tawy* — the "Two Lands". While this usually referred to the different geographic locations of upstream (Upper) Egypt and downstream (Lower) Egypt, it might also denote the two contrasting lands of *Kemet* — "the black land", made fertile by the silt from the flooding Nile, and *Deshret* — "the red land", named for the color of the surrounding deserts (James, p.17). Both the Nile Valley and its encircling deserts influenced and benefited the ancient Egyptians.

The Nile also provided an essential means of communication and transportation, for no place in the valley was more than a few miles away from the river and, until the New Kingdom, when the horse and wheel were introduced to Egypt, land travel was by foot or donkey. During the annual inundation, when most of the cultivated land and roads were flooded, the Nile was even more important as a means of travel (James, p. 21).

Due to the prevailing winds and the flow of the Nile, a boat could be carried by the current one way down the Nile, or it could raise a sail and be blown by the wind the other way upstream. The speed of travel along the river northwards and southwards helped to keep Egypt united under one government for almost all of its

dynastic history — a startling result of the geographic feature of wind patterns.

The regularity of the inundation, coupled with sunny, cloudless skies that are common throughout the Egyptian year, allowed Egyptian agriculture to be remarkably productive, especially compared to other ancient civilizations (James, p.25). The high productivity of the land can be shown by the fact that during the Roman Period, most of Rome's grain came from Egypt, and Rome came to rely heavily on Egypt for food (Time Life, p.76). However, even though the Nile generally flooded with reliability, there were times when the inundation was significantly lower than usual (Figure

2). During low-flood years life became harsh for the population and famine occurred. At these times, the king would have to increase taxes to purchase adequate food supplies for the nobility. Such a situation may have even led to the downfall of the Old Kingdom, creating the First Intermediate Period (c. 2181-2040 BCE), when drought significantly affected the entire Middle East (Bell, pp.1-26). A story written about the

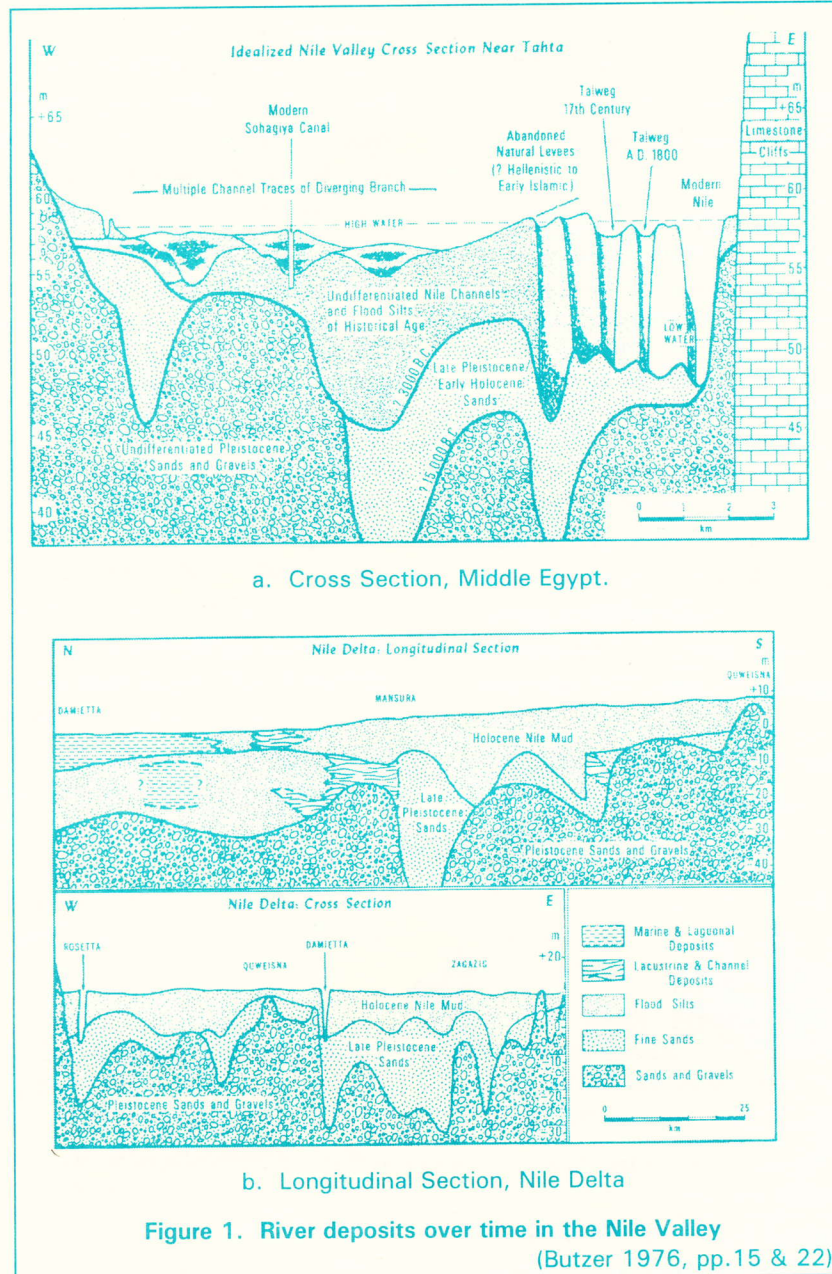



Figure 1. River deposits over time in the Nile Valley (Butzer 1976, pp.15 & 22).

First Intermediate Period, called *The Admonitions of Ipuwer* states,

"...Lo, the river is blood,
As one drinks of it, one shrinks from people
And thirsts for water...
The land is injured...
Lo, the desert claims the land..."
(Lichtheim, Vol. 1, p.149).

During the Middle Kingdom (c. 2040-1782 BCE), the priest Heqanakht wrote a series of letters home that described difficult times:

"...Now, the inundation is not very high, is it? Look, our rations are fixed for us in measure with the inundation. Endure this, each one of you! Look, I've managed to keep you alive up to today...A message: 'Being half alive is better than death altogether. Look, one should say "hunger" only about real hunger. Look, they are starting to eat people here. Look, they haven't been given such rations in any place here...'"
(Parkinson, pp.101-107).

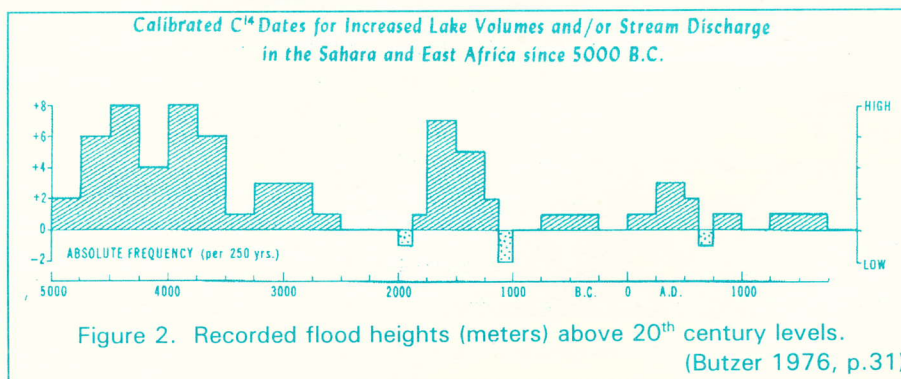
The Nile inundation not only influenced food production, but it also deposited mud, the main ingredient in adobe bricks. These required less skill to make and were much easier to transport and handle in bulk than was stone. The word "adobe" itself comes from the ancient Egyptian word *Djebet*, , signifying 'brick.' This word passed into Arabic and was transferred into Spanish during the Moorish occupation of Spain (James, 1994). The raw materials for mud-bricks lay profusely at hand, for Nile mud was almost unlimited and was replaced each year during the annual flood. Adobe buildings provided ample protection in Egypt, since storms were rare, and the houses of the people — from peasants to kings — were built out of brick. These houses could be easily enlarged, divided, or modified to suit the owner's needs (James, p.206).

In ancient times, the plant *Cyperus papyrus* grew in abundance in the marshes and pools of

Egypt (James, p.92). The ancient Egyptians had many uses for this plant and wasted little. Its stems were used as a primitive building material, or when separated into rind and pith, they were sometimes turned into a fiber used for boxes, mats, ropes, cord, and the writing material papyrus. Furthermore, the flowers of the plant were used for decorative purposes, making it one of the most useful plants to any civilization in history (James, pp. 31-32). Religious architecture was also influenced by the marshes where papyrus grew. The reeds and plants which grew around the banks of the river inspired temple architecture, which often had columns carved to resemble reed stalks (Montet, pp.300-302).

The desert around the Nile Valley provided other advantages to ancient Egyptian civilization in addition to the rich "gifts" of the river. Near the valley, from Lower Egypt to south of Luxor, are limestone deposits which provided a strong, lasting, and readily available building material that made monumental Egyptian architecture possible (Murnane, p.15). Without the large limestone deposits, such structures as the many pyramids of Egypt would never have been built, since other building materials would have been either too fragile or too expensive. Sandstone deposits, found primarily between Luxor and

Aswan, replaced limestone in the New Kingdom (c. 1570 - 1070 BCE). Because this stone was easier to quarry, the great temples of the later periods were built from it (James, 1994).



The Western Desert had little to offer the ancient Egyptians except for the large oases of el Kharga, el Dakhla, and el Bahriya (Figure 3). These oases, which were sporadically cultivated, were used for places of banishment of prisoners and as waypoints for the tracks which linked the Nile Valley to coastal Libya and The Sudan.

The Eastern Desert, however, was heavily used in antiquity. With its wealth of hard volcanic rocks, it provided many semi-precious stones used for jewelry, of which the most common were agate, amethyst, carnelian, chalcedony, feldspar, garnet, jasper, onyx, rock crystal, and turquoise. The Eastern Desert also provided large deposits of gold, granite, and copper (James, p.32; also see Figure 3 for locations of resources).

The geographical barriers of Egypt allowed trade to take place but made invasion difficult. The northern coastline had very few good harbors, since marshland surrounded all of the mouths of the Nile at the Delta. To the east and west were extensive deserts, and to the south the cataracts of the Nile prevented easy passage to and from inner Africa (Breasted, pp.6-7). While these barriers didn't constrict trade — for the ancient Egyptians often traded for such commodities as incense from Punt (perhaps Ethiopia), lapis lazuli from Afghanistan, ivory from central Africa, wood from Lebanon, and pottery from Cyprus -- they prevented large armies from entering the country (Erman, pp. 494-519). Similarly, Egyptian goods were traded throughout the Mediterranean, especially by Greek and Phoenician merchants during the

Late Period. *The Tale of the Shipwrecked Sailor*, written during the Middle Kingdom, gives evidence that the Egyptians actively traded with other peoples; the story is about a merchant sailor who is shipwrecked on a far-off island during a trading mission (Lichtheim, pp.211-215).

Not content to merely cope with their geographical limits, the ancient Egyptians undertook massive projects to improve the land around them. During the 12th Dynasty of the Middle Kingdom (c. 1991-1782 BCE), powerful pharaohs, such as Senusert III (1878-1841 BCE), diverted vast amounts of the annual Nile flood waters into Lake Moeris in the Faiyum Depression. They used this lake as a storage pond for irrigation water long after the inundation had receded, significantly increasing their arable crop land and food production (Breasted, pp.192-193). Other examples of ancient Egyptian public work projects include drainage and irrigation of the Delta and canals built to circumvent the rapids at the First Cataract of the Nile.

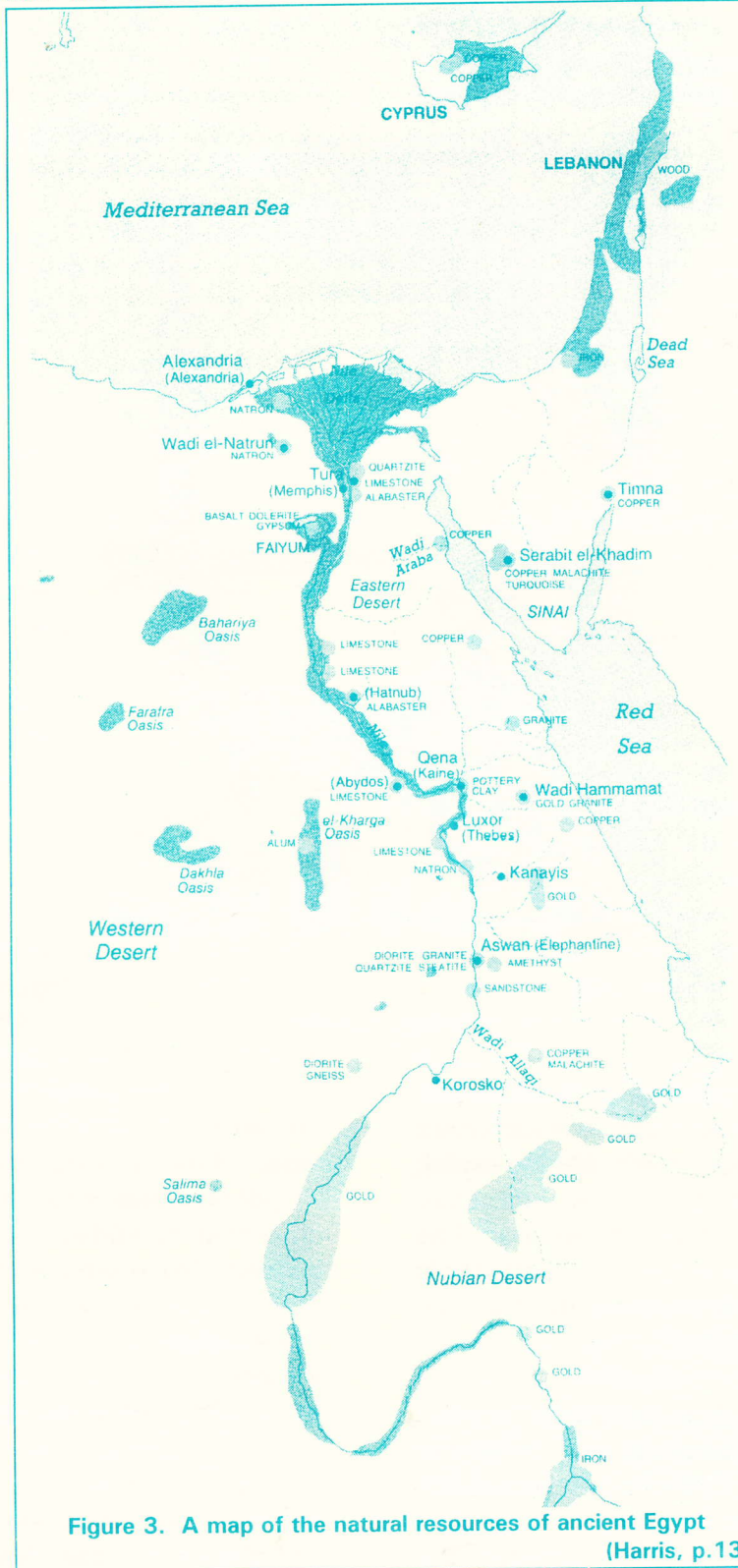


Figure 3. A map of the natural resources of ancient Egypt (Harris, p.13)

Ancient Egyptian religious beliefs were centered around familiar geography and were greatly affected by it. The annual flooding of the Nile and its deposit of the rich soil gave the

Egyptians their characteristic idea of rebirth, for every year the land would replenish itself through the flood. Another notion of rebirth for the Egyptians came from the sun and the stars, for both disappeared and reappeared at regular intervals. They compared the duration of day with the duration of life, and at the end of each life (day), the person's spirit would join the sun whose barque sailed into the *Amduat*, or Netherworld; thus, since the sun set in the west, the ancient Egyptians came to equate the west with the realm of the dead.

Next to their pyramids, the kings of the Old Kingdom buried full-sized sailing ships (Figure 4), to allow them to journey up to join the sun god, *Ra*, and to accompany him towards the west as the sun set into the Underworld. The realm of the dead even had a similar layout to the land of Egypt: a main river valley, cataracts and other hazards in the river, agricultural fields, and cycles of day and night. The Egyptian concept of paradise, the Field of Reeds, was merely an extension of daily life, with each worker performing the tasks of their former profession, though their eternal work was never supposed to be harsh, and their endeavors would always be successful. The Egyptians even stocked their tombs with tools and everything they could possibly need in the afterlife (Spencer, pp.139-164).

The Pre-Dynastic Egyptians probably located their graves in the desert because they had more permanence than graves in the moist soil of the river valley. Since little or no provision was made to keep sand out, it often entered the graves and leached all the moisture out of a body, saving the corpse from decay.

Many samples of these types of burials have been found with the hair and skin still adhering to the bones. Exposed by animals, erosion, or the accidental cutting of a new grave into an old one, these naturally preserved bodies probably influenced the ancient Egyptian process of body preservation (Spencer, p. 30).



Figure 4. Khufu's solar barque, found in a pit near the Great Pyramid. (Photo by Author)

Later, however, natron supplies from several oases provided another alternative: mummification, an elaborate process which involved removing all the perishable organs, desiccating the corpse in a bed of natron salts, and wrapping it in linen. This greatly enhanced the preservation of the body which was so essential to the ancient Egyptian religion. They believed the image, or the "genius" of a person, the *ka*, could only survive if it could rest in a recognizable body of the deceased during the day (Erman, pp.306-308).

In the Old Kingdom, desert graves were replaced by mastabas (funerary buildings) and pyramids, which protected the body from the surrounding sands. These tombs proved to be easy to rob and they, in turn, were replaced by rock-cut tombs, which in the New Kingdom, were secretly made by the kings to protect their burials. Each sepulcher was often divided into rooms and furnished like a house. These tombs could not have been made without the ancient Egyptians' great skill in surveying, a science that grew out of the need to redraw boundaries after the annual inundation. The need to quickly and accurately reestablish boundaries played a factor, later, in the success and the short building time of the vast funerary complexes of the New Kingdom. Surveying reached its peak in dynastic times (Spencer, pp.74-85).

In conclusion, ancient Egypt's national unity, stability, commerce, architecture, and religion were strongly influenced by its natural geography. Furthermore, the changes in climate and topography substantially contributed to the development of dynastic civilization. The Egyptians adapted to their environment, took advantage of its natural benefits, and carried out irrigation and other improvement projects to enhance their civilization. These characteristics led Egypt to become a major world power as civilization advanced. Military geniuses, such as Alexander the Great, Julius Caesar, and Napoleon Bonaparte, were all motivated to conquer Egypt so that they, too, could benefit from her strategic location and advantageous geography.

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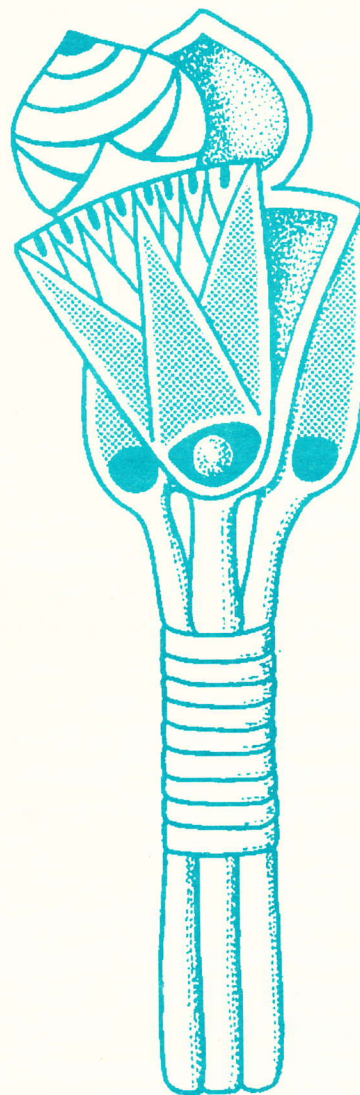
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Wooden cosmetic spoon with lid.
The British Museum, 5966, 18th Dynasty.

TAU AN ANCIENT EGYPTIAN BOARD GAME by Graeme Davis

About the Author: Graeme Davis was an Ostrakon editor until he left Denver. However, he has kept in touch and has been our reporter and 'ambassador' at large. Davis is now living in Washington DC. He now works for Magnet Interactive Studios, designing CD-ROM games and nonfiction products and Internet Web services.

[A slightly different version of this article first appeared in **KMT, A MODERN JOURNAL OF ANCIENT EGYPT**, Vol. 4, No. 2, entitled "Reconstructing Rules for the Ancient Egyptian Game of Twenty Squares (Tau was renamed the game of 20 squares)." Used with permission of KMT.]

Most readers are familiar with *senet*, or *senat*, the Egyptian board game found in the tomb of Tutankhamun and elsewhere. Several modern versions of this game have been published commercially with various sets of rules.

Tau, although a less famous game, seems to have been just as popular in ancient Egypt. In fact, more than one *senet* board has been found to have a tau board on the back. The layout of the board has some intriguing similarities to the famous game boards found in the royal tombs at Ur of the Chaldees, which date some 1,500 years earlier. Tau may also be the same as the game of *polis* mentioned in Plato's *Republic*. All in all, tau seems to have a pedigree which is at least as distinguished as that of *senet*, and does not deserve to be overlooked.

As with almost any ancient game which has not survived into the present day, it is difficult to reconstruct the rules of tau. This article represents one person's attempt at this, but readers are warmly encouraged to experiment and adapt and use whatever rules they find best.

In trying to deduce a set of rules for tau, I have tried to draw as much information as possible from the actual boards and pieces and avoided the influence of other people's reconstructions and rules from games which seem to be similar. At least one set of rules for the Ur game is commercially produced (and protected by copyright!), but this may not be much help in reconstructing tau. In the first place, the differences in board layout will affect play significantly; secondly, the dice with the Ur game seem to have been two-sided rather than the four-sided "long die". Besides, a similar board and pieces do not necessarily imply similar rules. Just think of the number of games that can be played with a conventional set of checkers!

The Gaming Set: Like *senet*, tau seems to have been played with ten "men" to a side. They were even the same pieces on some occasions, for it is not uncommon for a gaming set to have a *senet* board on one side, a tau board on the other and a drawer to hold the pieces and dice. The dice were "long dice" (Fig. 1): short wooden

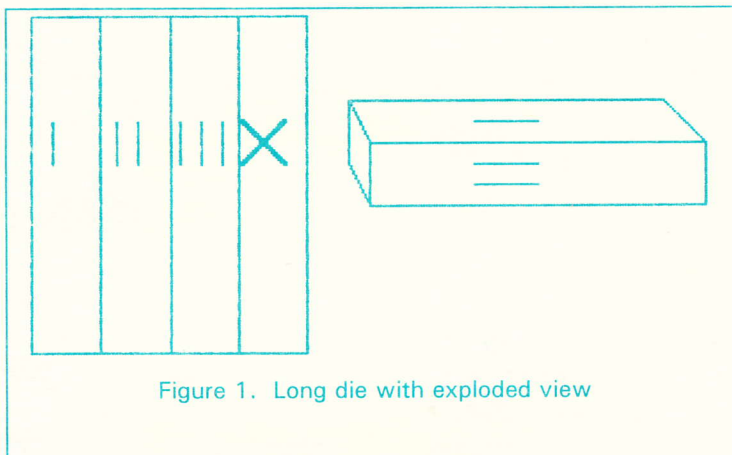
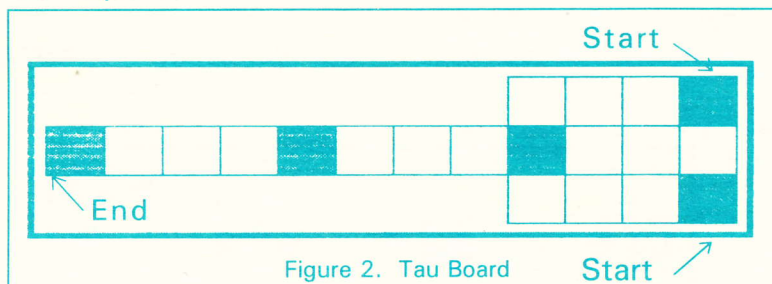


Figure 1. Long die with exploded view

sticks of square cross-section, marked I, II, III, and X. The same markings are found on the last four squares of the *senet* board, so there is little doubt that the dice were intended to give a score from 1 to 4 rather than 0 to 3.

The playing pieces ranged from plain, pawn-shaped objects to miniature works of art, something like the chess knight but with the heads of dogs, lions, or occasionally, men rather than horses. Although *senet* was probably played with ten pieces to a side, tau may have used only seven, like its predecessor from Ur. In all likelihood, the precise rules and the number of pieces may have varied from time to time and place to place - this was very common in the time before written rules became the norm.

The Board: The tau board (Fig. 2) was roughly banjo-shaped, with a central file of 12 squares and two side files of four squares each. It is similar to a board from Ur (Fig. 3) but the side-squares of the short-er end are straight-ened out into a single file.



Some — but not all — of the tau boards found have marked squares. The most striking is an ivory example from Enkomi in Cyprus which has rosettes placed in every fourth square -- an arrangement which is almost identical to the placement of the flower designs on one of the boards from Ur. Other boards are marked differently or not at all.

The Rules: The first question which needs to be answered is whether tau is a race game or a war game. The elongated shape of the board, and the fact that there is a single track for much of the way, strongly suggests a race game.

Most games from the ancient Mediterranean area were race games; and war games -- draughts, chess and its ancestors, the Viking *hnefatafl*, and the Roman *ludus latruncularum* were nearly always played on square boards. At the time tau was played, most of the classic war games had not yet been invented.

Having decided that we're dealing with a race game, now we must decide the direction of movement around the board. This comes down to a simple choice: do pieces enter the board on the end square of the center file, or on the end squares of the side files? The latter seems more likely, as this gives each player a chance to "set up" his pieces in the safety of the side file before battle is joined on the center file. Play in the other direction results in a feeling of anticlimax -- once a piece has turned the corner into the safety of a side-file, it is certain to finish, instead of the tension of battle maintained to the last move.

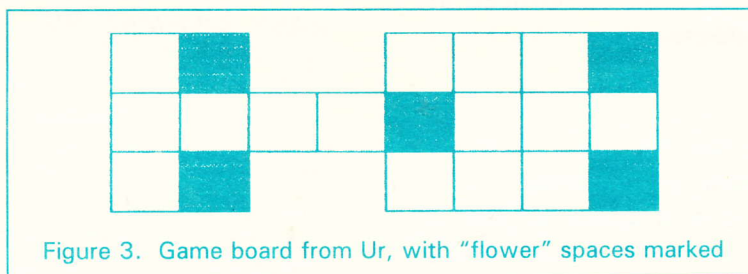
Thirdly, and most difficult, it is necessary to decide on the meaning of the marked squares. The flowers on the board from Ur and the later

one from Enkomi do not suggest anything; neither do the birds differently placed on a board from Ak-hor. Some players may decide, like the ancient owners of unmarked

boards, to do without special squares altogether. The possibilities are almost endless. The special squares might give the player who landed on them another move or some penalty such as a move backwards. A piece on a marked square might be safe from capture or might cost its player a fine if the game was played for money.

Some possibilities can be discounted. For example, it is unlikely that a marked square gives immunity from capture since three marked squares -- at the bottom of each side-file and at the end of the center file -- are squares where capture by surrounding is impossible (rules for capture are discussed later). In the end, somewhat subjectively, I decided that landing a piece on a marked square gives a player a free turn. This makes players concentrate their tactics on reaching as many marked squares as possible; and means that no matter how far a player may be in the lead, his opponent can always come back through a combination of lucky throws and shrewd moves.

Capture might be by displacement (i.e. moving onto a square currently occupied by an enemy piece will knock it off the board). However, a reference by Plato to the game of polis suggests



that capture in this game is by surrounding. The name of the game means "city," and Plato used the game as a metaphor for Greek city-state politics. The only real clue he gave about playing

the game was a suggestion that a player should keep all his dogs (i.e. dog-headed playing pieces) together so that none is captured. This

suggests that pieces could be captured by being cut off and surrounded. Since dog-headed pieces were popular for both senet and tau (some distinguished Egyptologists have suggested that the pieces represent the jackal-headed god Anubis), it could be that the Greek game of polis is descended from tau.

Reconstructed Rules for Tau:

Having made various deductions, conjectures, and inspired guesses from the available evidence, it's

time to set down some rules and see if they work! As I've already said, I make no claims about authenticity, since no trace of Egyptian rules for tau has yet been found. Different ideas of how the game might be played are found in the references cited below, and readers should feel free to experiment with rules until they have something that suits their own preferences. My only claim is that the following rules fit the components, are playable, and provide entertaining and moderately challenging games.

But enough disclaimers—on with the rules...Each player has ten pieces (seven if a shorter game is preferred). The board is placed between the players so that each player has a side-file near him. The game uses a four-sided die, which can be obtained from most hobby game stores. A six-sided die may be used if preferred, but given the placement of the marked spaces (every fourth square), this changes the tactical aspects of the game.

Play begins with all pieces off the board. Each player rolls the die, and the player with the higher score moves first. The die is re-rolled in the event of a tie. The players then take turns rolling the die and moving.

A player moves by rolling the die and moving a piece the indicated number of squares. The player may choose to move a piece which is already on the board or to move a new piece onto the board. Pieces are moved onto the board at the squares marked START on Figure 2. A player may have any number of pieces on the board at a time, but no square may hold

more than one piece. A piece may move over an occupied square into a free square, but may not move into an occupied square.

The object of the game is to move all your pieces off the board from the square marked END on Figure 2. An exact roll is required to move a piece off the board—for example, a piece on the END square needs a roll of 1 to move off the board.

A player must move, if possible, even if this results in the immediate capture of the moving piece. If a player cannot move any piece the number of squares indicated by the die roll, the turn is lost and play passes to the other player.

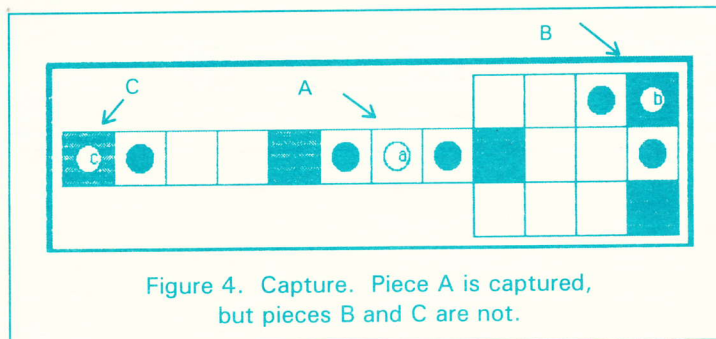
Pieces on the center file may be captured by enemy pieces. A piece is captured if there is an enemy piece on both sides of it (see Figure 4). Captured pieces are returned to their player, and added to the stock of pieces which have not yet entered the board.

A piece which lands on a marked square entitles its player to throw again and make another move. There is no limit to the number of moves which may be made in a single turn by this means. A player may choose to decline a free move.

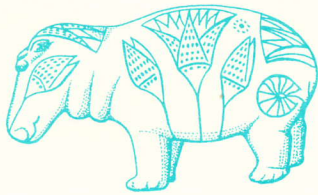
The winner is the first player to move all his pieces off the board.

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LECTURE NOTES



Blue glazed hippo. Tomb of Senbi, Meir. Metropolitan Museum of Art, NY

EGYPT AND MESOPOTAMIA: ANCIENT RIVALS, ANCIENT FRIENDS

Presented by Robert Chadwick

ESS Meeting, May 1995

Notes by David Pepper & Jill Taylor

Robert Chadwick, a dual US/Canadian citizen, teaches at John Abbott College in Quebec. He has a Ph.D. from the University of Montreal. An Assyriologist and archeo-astronomer, he has published a book in the First Civilization Series called **ANCIENT EGYPT AND ANCIENT MESOPOTAMIA**. Originally from Denver, he credits the beginnings of his interest in the ancient World as having started with his visits to the Denver Museum of Natural History as a child.

Chadwick's lecture was well received, and this popular speaker compared these two civilizations by putting side-by-side slides on the screen: ancient Egypt on the left, and ancient Mesopotamia on the right. He maintains that, although they are both far away in distance and time, they have a relationship to our civilization, due to their impact on pre-classical times. Egypt, for example has given us the 365 day calendar, the 24 hour day, and paper. Monotheism was also first experimented with in Egypt. Writing and the wheel came from Sumer around 3500 BCE, and the first serious attempts at astronomy and astrology were done in Mesopotamia.

Surprisingly, there never was a group of people called Mesopotamians, nor was there a language called Mesopotamian. The word Mesopotamia means "between the rivers." It is essentially a geographical term. The Tigris and Euphrates rivers both start in the Zagros mountains and

run some 1,500 km to the sea. They ran past cities like Babylon (which means the "gate of the gods"), down to the marshlands of the Persian Gulf. This area was home to the Sumerians in the third millennium BCE, the Babylonians in the second millennium BCE, and the Assyrians in the first millennium BCE. Cradled by the rivers, the inhabitants of Mesopotamia were widely influenced by the diverse ethnic peoples of the surrounding lands. Mesopotamia was, and is, a multi-cultural, multi-linguistic part of the world.

When the Tigris and Euphrates rivers flood, they brought renewed soil, and renewed life to this area. But what made this area different from Egypt was that these rivers flood in the spring, just about the time the harvest came in. An early flood actually endangered or even destroyed the harvest, and in some years left the people without any food. About 2900 BCE there was a story in Sumer about a man who built a boat and took his friends and his family and rode out a violent storm and its resulting cataclysmic flood that lasted for seven days and six nights. In Egypt, the Nile was perceived as a peaceful and benevolent river, so there was no flood story. Unlike the Nile, the Mesopotamian rivers' current and wind go in the same direction. Hence, large canal systems were built next to the rivers to pull the boats up against the winds and current using human or animal power.

The term, Egypt, however, refers not only to a particular area, but also to a single group of people with a common language. It was, therefore, a uni-lingual, uni-cultural society. Egypt's surrounding deserts also helped to keep it isolated for most of its history. Like its Mesopotamian counterparts, the Nile was a life-giving river, bringing water and soil nutrients to the people. The Nile, however, flooded after the harvest was completed, and before new crops needed to be sown. The opposing wind and water currents of this river also made travel by boat much easier than it was in Mesopotamia.

The fact that Egypt's borders were more secure, meant that her people had more time and energy to devote to large-scale building projects, and her rulers could more easily move large numbers

of people for longer distances up and down the river into an area as temporary labor. During this same time in Mesopotamia, her people were building defensive works and city walls, for not only did they have to contend with outside invaders more often, their city-state system meant they fought each other more often than not.

Mesopotamia's civilizations influenced Egypt in a number of ways. Writing appears to have developed in Mesopotamia in the middle of the third millennium BCE from picto-grams, and the idea of writing was quickly picked up by the Egyptians within a few hundred years. The Mesopotamians also used clay tablets and stamped them with a cylinder seal to identify the owner of the document. These cylinder seals were also adopted by the Egyptians who put their own engravings on them.

Chadwick spoke of the story of Gilgamesh, and his quest for immortality. In Mesopotamian lore, humans were pre-destined to die, only the gods had immortality, and when a person died, he lost his status upon entering the Underworld, which was not a pleasant place to go. It was a very pessimistic view of life-after-death. So the Mesopotamian motto was "live for today."

As we know, the Egyptians had a very different view of death. They anticipated a wonderful afterlife, and prepared for it by constructing elaborate tombs and mummifying the body. Their two basic options for the afterlife were the Gentleman Farmer, and the Hunter's and Fisherman's Paradise. Hence the Egyptian view of life-after-death was very optimistic.

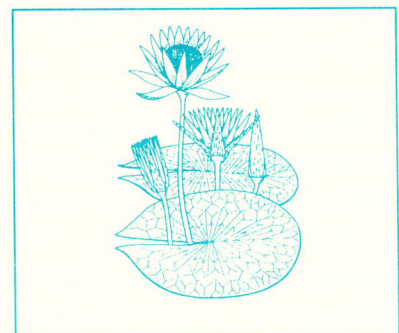
While Egypt had its pyramids, Mesopotamia had its ziggurats. Some people have claimed that the pyramid influenced the ziggurat, but they have been proven to have been built later than the Step Pyramid in Egypt, and both serve entirely different functions. Made of mud bricks, a ziggurat could reach 150 feet in height, and it had a stairway up the outside. It was meant to be climbed and had a temple on top. This was the place the priests went to be elevated above the profane world. They were temples, not tombs.

After about 1,000 years of isolation, the Egyptians broke out of the Nile valley and started to build an empire. About 1550 BCE the Egyptians conquered Palestine and reached the borders of the Mitanni, who lived in Mesopotamia. The international correspondence of that time was in Akkadian, and a cache of tablets written in that language has been found at Amarna [known as the "Amarna letters"]. For example, the king of the Mitanni recorded that he sent a statue to king Amenhotep III to heal him of a sickness.

About 800 years later, the Assyrians from northern Mesopotamia conquered most of the mid-east, pushing through Egypt as far as Aswan, but they did not hold the country for very long. Using siege engines and battering rams, they were called the Prussians of the ancient world. They conquered the 25th Dynasty of Egypt, the Kushite rulers of the Egyptians. The Assyrians also captured prisoners for slave labor, deporting them *en masse* back to Mesopotamia. One record shows 200,000 Egyptians living in Mesopotamian lands being assimilated into Assyrian culture. There was no such migration in the other direction.

Some books claim that the Egyptians were adept astronomers, but Chadwick feels they were not. While the Old Kingdom kings believed that part of their soul, the *akh*, would fly off to join the eternal stars, they only had names for a few constellations, and about 40 stars.

As Chadwick's lecture drew to a close, the audience was sorry that it was ending. He concluded by pointing out that he had provided evidence that while at times these two civilizations were ancient rivals, there were also periods of extensive borrowing and copying when they were ancient friends.



IN SEARCH OF A ROYAL TOMB

Presented by Daniel C. Polz

ESS Meeting, June 1995

Notes by Richard Harwood

Following the growing tradition of outstanding lectures by equally outstanding professional Egyptologists, the June 1995 ESS program was presented by Dr. Daniel C. Polz. Trained in his native Germany and a graduate of the University of Heidelberg, Polz has been Assistant Professor of Egyptology at UCLA since 1991. He is currently the Director of the UCLA Excavation at Thebes, which, in conjunction with the German Institute of Archaeology, has been excavating the necropolis at Dra' Abu el Naga to the immediate northeast of the Valley of the Kings. This lecture outlined the project's attempt to locate and identify the lost tomb of Amenhotep I and summarized the project's results through the 1995 season.

Amenhotep I was the second pharaoh of the 18th Dynasty (1525-1504 BCE), some 50 years before the joint reigns of Hatshepsut and Tuthmosis III. Following the expulsion of the Hyksos (1550 BCE) by his father, Ahmose, Amenhotep reorganized the government and extended Egypt's holdings from Palestine well into Nubia. He is regarded as the founder of the workmen's village at Deir el Medina and by the end of the 18th Dynasty was deified as the founder of the Valley of the Kings.

Interestingly, however, Amenhotep I's tomb has never been positively identified, although he is known to have been buried somewhere in the Theban necropolis based on the discovery of his mummy and sarcophagus in the area. Three tombs to date have been proposed as that of Amenhotep I. Most current Egyptologists accept a tomb near Dra' Abu el Naga, identified by Howard Carter in 1916, as the true burial location. Polz disagrees. For the past two seasons, he has been excavating another tomb he believes may be the actual tomb of Amenhotep I.

One of the many problems encountered in identifying any tomb of this period is that royal
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tombs were uninscribed and undecorated until that of Tuthmosis III (KV 34), nearly 75 years after the death of Amenhotep I.

During this fascinating lecture, which was accompanied by excellent slides, Polz traced his quest for the "real" tomb. His primary guide was the *Abbott Papyrus* in the British Museum which details the inspection of numerous tombs by high officials during the time of Ramses IX. This document lists the tomb of Amenhotep I as being intact at that time (c. 1125 BCE); measures it at "120 cubits [197 ft.] in depth [or width] from the stele"; and locates it "north of the Temple of Amenhotep of the Garden". Unfortunately, many key words in the papyrus are subject to several interpretations.

Polz and his team obtained a concession to excavate in the northeast half of the village of Dra' Abu el Naga and in the cliffs above the village. Following their interpretation of the *Abbott Papyrus*, the group soon located two large forecourts and a nearly hidden tomb entrance in the cliffs above the village. The tomb was not unknown, having been documented by Sir Gardner Wilkinson in 1820.

The forecourts were buried under four to five meters of debris, and the project's most recent season was spent clearing this area. The entrance to the tomb turned out to be a vertical shaft with a passage branching off from it. At the end of the passage was a small chamber in the wall and a separate anthropomorphic recess in the floor which may have served as the location of a burial. There were no clues in the shaft, the passage, the chamber, or in the recess as to whom the tomb originally belonged.

Nevertheless, Polz believes this tomb may be that of Amenhotep I for a number of intriguing reasons:

1. In addition to the tomb of Amenhotep I, the *Abbott Papyrus* records the inspection of several other tombs, none of which lie within the Valley of the Kings. It is, therefore, reasonable to assume that, despite the fact that Amenhotep was considered to be the founder of the Valley, his tomb does not lie within it.

**EGYPTIAN SACRED ART:
THE POWER AND THE GLORY OF THE TEMPLE**
Presented by Floyd Chapman

ESS Meeting, July 1995
Notes by Jill Taylor

Still another perspective of ancient Egypt was presented to ESS members by fellow member and extremely talented historical artist, Floyd Chapman. The audience was primed for the forthcoming lecture with a preview of Chapman's extraordinary paintings set up in the back of the auditorium: an historical depiction of Tutankhamun in the sacred sanctuary, a mystical portrayal of Nefertiti being touched by the one-god, Aten, and finally and the most remarkable, a detailed, archeologically accurate, full-color reconstruction of a painted wall relief located in the Temple of Ramses III at Medinet Habu. This magnificent scene depicts Ramses III kneeling before the Theban triad [Amun, Mut, and Khons]. This temple was the only significant building project produced during the reign of Ramses III (1194-1163 BCE), and the last major work of Egypt's Dynastic Period.

Chapman's enthusiasm for his work came through clearly as he discussed the results of his in-depth research on temple paintings and decoration as well as the mythological significance of their imagery. He explained that we cannot truly appreciate or understand the sacred art of the ancient Egyptians without knowing the fundamental concepts and beliefs which shaped their world view.

Organizing his lecture into three parts, Chapman first explained the mythological origin and function of the temple and the role of its decoration in fulfilling that function. Next, he discussed the role of the pharaoh in the Egyptian world view, and then he explained his methodology for producing his authoritative reconstruction of the above-mentioned Medinet Habu scene.

It was explained that the Egyptians had elaborate mythology which told how the creation was produced through several phases. The emergence of the temple was an integral part of

2. The two forecourts contain artifacts from a long period of time following the actual burial. Most notable are the objects from the tomb of Ramses Nakht, High Priest of Amun during the reigns of Ramses IV through Ramses IX: a mud brick with a broken royal cartouche containing two glyphs that may be part of the prenomen of Amenhotep I; the remains of a mud brick pyramid in front of the tomb of Ramses Nakht; and the sandstone fragments of stelae, chapels, etc. dating from the reigns of Ramses II through Ramses IX. It is well documented that Amenhotep I was deified by the end of the 18th Dynasty as the founder of the Valley of the Kings, therefore, it would be appropriate for the officials of succeeding pharaohs to build monuments near the burial of Amenhotep's tomb.
3. The forecourts continued to attract religious attention for at least two millennia, as evidenced by their use by Coptic Christians.
4. The tomb Polz found measures 120 cubits from the front of the forecourt (where stelae traditionally would have been erected) to the back of the wall of the tomb, as recorded by the *Abbott Papyrus*. In order to arrive at the same measurement, Howard Carter had to include the depth of the so-called "grave-robbers shaft" of the tomb he proposed, a measurement that would probably not have been made by the tomb inspectors during the reign of Ramses IX.
5. The tomb is directly north of a known temple of Amenhotep I as opposed to the tomb identified by Howard Carter, which is only vaguely north of the same temple.

The spring 1996 season of the UCLA Excavation at Thebes will be spent in the final clearance of the two forecourts of the tomb. Dr. Polz has graciously offered to return to Denver to update the ESS on further developments in this important and exciting project.



each phase of creation. The temple provided shelter for the deities and acted as a defense against the forces of chaos which threatened to reabsorb all vestiges of the phenomenal world back into the Realm of the Nonexistent. To the Egyptians, every temple was a necessity to assist the gods in their eternal work of sustaining the physical and spiritual creation -- in other words, the divine order, *Ma'at*.

There were two types of temples in ancient Egypt: the cult and the mortuary. The cult temple was the home of a specific god or goddess, and the mortuary temple was dedicated to the worship of the deified pharaoh. Each temple was structured as a symbolic microcosm of the world just after creation. The basic elements consisted of a pylon, forecourt, hypostyle hall, barque room, and sanctuary with adjacent subsidiary rooms. Since any and all of these components could be multiplied, and often were by successive pharaohs, no two temples were exactly alike.

The Egyptians believed in a universal force called *hike* (what we might call magic). This force was the agency through which the creator produced and sustained all of creation, and all supernatural acts were produced both both by gods and men. The Egyptians believed that once the ritual of the opening of the mouth was performed upon the carved and painted images decorating every inch of the temple walls, these same images became a living reality by means of *hike*, thereby, insuring the perpetuation of the divine order of *Ma'at*, while chaos was kept at bay.

Chapman's methodology in reconstructing his temple wall scene included studying in great detail (sometimes with a magnifying glass!) the remarkable scenes throughout this beautiful temple, which still retain much of their original polychrome decoration. Much research went into determining the "rules" for decorating temples. The "cannon of proportions" which set up the grid system for the wall paintings was followed from the time of Narmer through the 25th Dynasty. The Egyptian palette had only six or seven colors: red, blue, yellow, green, white, black, and (in the New Kingdom) a light-blue or turquoise. Chapman sought out the tiniest traces of patterns and colors in order to produce a
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painting just as the ancient Egyptians would have seen it before time and man took their effects.

From his great attention to details, it was apparent that Chapman's paintings were truly the result of a labor of love of this fascinating culture known as ancient Egypt.



*Cosmetic Spoon, Petrie Museum
(UC 14365)*

BREWERS, BAKERS, AND BUILDERS

Presented by Dr. Mark Lehner

DMNH Lecture, September 1995

Notes by Judy Greenfield

Dr. Mark Lehner, perhaps best known as the world's foremost expert on the Sphinx, began his career in Egyptology as a graduate student at the American University in Cairo. He subsequently earned his Ph.D. in Egyptology from Yale University. Lehner has been featured in numerous magazines and appeared in **NATIONAL GEOGRAPHIC** publications and films. When he's not overseeing the Giza Plateau Mapping Project, of which he is director, Lehner is working on three pending books: **THE COMPLETE PYRAMIDS, ARCHEOLOGY OF AN IMAGE: THE SPHINX, and GIZA REPORTS.**

The Great Pyramids, with their grandeur and sheer massiveness, have intoxicated explorers, Egyptologists, Egyptophiles, and visitors alike since the rediscovery of these monuments in the last few centuries. But who were the "little guys" who toiled to build these great structures? Where were their towns located in relation to the Great Pyramids? How were the armies of workmen fed? And, most importantly, *How did they bake their bread?*

The last question was one that our guest lecturer, Lehner, set out to answer. Some other insights about the life of these workmen emerged from this quest.

The lecture focused on the time period 300 to 500 years after the first unification of Egypt, during the glory days of the Old Kingdom. Monuments and fine sculpture, including the barque of Khufu and, of course, the pyramids, attest to the technical sophistication and artistry of the era. Much is known about the upper echelon of society from this period but little about the common folk who formed the base of the *economic* pyramid.

Lehner was perplexed: something important was missing from the Giza Plateau. Where were the towns belonging to the many people who built the pyramids, this "missing silent majority"? He

scrutinized maps of the Giza Plateau as well its geology and topography. A cone of mud, used to seal a jar, held the tantalizing clue: "Overseer of Bakeries." Towns to accommodate the laborers *had* to be in the vicinity. Lehner chose to excavate an area south of a massive stone wall near the pyramids, 200 yards long, with colossal gates 21 feet high. He hit pay dirt when a worker accidentally gouged the desert floor with a back hoe, revealing rectilinear mud and stone walls. Bread pots - thick, bell-shaped vessels - came to light. Lehner, with the help of the backhoe operator, had discovered two intact bakeries, side by side.

Although scenes from ancient tombs (notably of Ti, in Saqqara) depict the bread baking process in great detail, some of the features uncovered could not adequately be explained. These mysterious features include a series of semi-circular craters in the layers of ash on the floor and four ceramic vats. Plus, a paleobotanist, using flotation methods, recovered only barley and emmer wheat seeds, neither of which has the gluten content of the wheat we use today. Gluten enables bread to rise and lends a light, spongy texture.

At this point, the lecture became part mystery, part comedy, and utterly fascinating. Lehner decided to replicate an Old Kingdom bakery based on his findings, with funding from the National Geographic Society which filmed the process. It took the Egyptian workers a mere three hours to create an exact replica of the ancient bakery - which had taken the crew *months* to excavate!

Lehner enlisted the help of Ed Wood from Utah, an *ancient yeast specialist* and author of **WORLD SOURDOUGH BREADS OF ANTIQUITY**. Yeast was the way to circumvent the "gluten problem." Ed Wood successfully captured wild yeast in Egypt by "baiting" it with potato water and this was used to leaven the experimental bread. The bake-off commenced using emmer and barley (in a 10-20% to 80-90% mixture). After innumerable modifications and many inedible trials and errors, a "successful" loaf, albeit dense and coarse, was produced. Mysteries were solved in the process. The archeological "craters" were formed by the

rounded bottoms of the bread baking vessels, nestled in hot ash to cook. And the need for four vats became apparent: one each for yeast, water, flour and mixing. Baking bread, Lehner learned, was performed on a massive scale (to fuel workers) and was not undertaken for special occasions, as once thought.

Last winter, Lehner and his team discovered that the bakeries were only part of a huge mudbrick building. Another area contained dishes, plates, very long and low benches, jar stands, flint blades, and fish bones. This, in effect, was what remained of a very large mess hall for the workers.

The lecture ended on a sobering note. The encroaching city of Cairo threatens to obliterate these remarkable ruins which have so much to tell us about everyday life of the "Little Guys" who built the Great Pyramids.



**THE VALLEY OF THE KINGS
FLOOD PROTECTION PLAN
Presented by John Rutherford**

ESS Meeting, October 1995
Notes by Judy Greenfield

Dr. John Rutherford is currently involved in conservation efforts in the Valley of the Kings. He has worked extensively in the Valley as a consulting engineer and was involved in partially clearing and surveying the tomb of Ramses II (KV-7).

The geomorphological problem with the Valley of the Kings can be explained, according to Rutherford, by imagining the Valley as a giant bath tub. Rainwater pours down the steep-sided valley and drains out through the Valley entrance. Typically, the area receives a mere centimeter of rainfall each year. Yet, every 200 to 400 years, the Valley experiences flash flooding during which rainwater and rock debris pour into the warren of tombs, causing a multitude of problems. The most recent flash flood

inundated the Valley a year ago, in October 1994.

The Valley tombs are cut into cliffs formed of Theban limestone, a semi-hard stone. The quality of the limestone decreases with depth, and is underlain by Esna shale. Shale, composed of clay minerals, is notorious for swelling upon contact with water. Water enters tombs through the opened entrances to tombs and through fissures through the limestone overburden.

Damage may be directly or indirectly caused by floodwater as was illustrated by Rutherford's dramatic slides. Direct damage includes loss of paint and surface layers of the tomb when moisture draws salt in solution to the surface. When it crystallizes beneath the surface layer, it causes rock and surface (sometimes paint!) to spall off. Floodwaters, laden with sand and debris, swirling through the structures, cause damage by abrasion. The water itself can dissolve paint which is bound with water-sensitive media. Indirectly, floodwaters swell shale columns abutting the limestone. Upon drying, the shale shrinks, causing tension fractures and eventually collapse. Another indirect result of inundation is slippage of massive blocks of stone along joints.

Rutherford proposed some ways of mitigating floodwater damage. The Egyptian organization, the Supreme Council of Antiquities, has implemented its own measures, some of which helped the Valley of the King tombs weather the 1994 floods. However, some proved ineffective. Possible methods of minimizing flood damage include lowering pathways through the Valley to create deeper channels for runoff, sealing rock joints, raising and reinforcing entryways, removing tailings and debris from the vicinity of tombs, and sealing doorways. Such efforts may extend the life of the tombs 500 or, perhaps, 1,000 years. Inevitably, despite all measures, these monuments will return to the elements from which they were created.

Rutherford also discussed the ethics governing conservation of the tombs as set forth by three organizations and also acknowledged paradoxes

inherent in these guidelines (for example, don't reconstruct original artifacts but do make certain your reconstructions are distinct from the originals!). Tomb preservation, we learned, is no black and white matter.

At the conclusion of his very well-organized lecture, Rutherford distributed an opinion poll of sorts. The ARCE Egyptian Antiquities Project, through funding by the United States Agency for International Development (USAID), will sponsor a team of Egyptian and American engineers and scientists to survey the Valley of the Kings tombs. Ultimately, the team will prepare a list of measures to help protect the tombs against floods and other natural agents of deterioration. The audience was asked to rate the tombs according to their artistic, architectural, historic, economic, religious, and overall significance. The results of the survey will be relayed to the team who will decide which endangered tombs receive top priority for preservation measures. It's exciting that ESS members can participate in this study by providing input on their favorite Valley tombs. Perhaps the ESS membership will be treated to a sequel to this lecture in the future, and we will learn the results of the tomb survey.



**MORTUARY TEMPLE OF MENTUHOTEP II AND
AN OVERVIEW OF DEIR EL BAHRI**
Presented by Richard Harwood

ESS Meeting, November
Notes by David Pepper

Harwood is a graduate of Dartmouth University, and Duke University Law School. He has visited Egypt three times, this past year with the Valley of the Kings Motif Alignment Project, a group working under the direction of Richard Wilkinson of the University of Arizona. He has also spent some time researching Mentuhotep II's Temple at the Metropolitan Museum's archives in New York City. Harwood recently retired from his position as head of the Trust Department at Bank One in Colorado Springs.

Harwood began his talk by describing his first visit to Deir el Bahri. His tour group spent time looking around Hatshepsut's mortuary temple and then started up on the overland trail to the Valley of the Kings. It was on the ancient trail, just above Deir el Bahri, that he noticed that there was another large structure just to the south of the Temple of Hatshepsut. Quickly leaving the overland hike, he rushed back down to the site of this other monument, only to be turned away by guards from the Polish Mission, who were working on another small temple, that of Tuthmosis III, nestled in between the Temple of Hatshepsut, and the other large structure he had noticed. On a subsequent visit he finally got to explore this ruin: the Middle Kingdom temple of Nebhepetre Mentuhotep II.

Mentuhotep's temple had been standing for some 600 years when the architect Senenmut began erecting Hatshepsut's funerary temple beside it. Hatshepsut's monument was similar in design to the older temple, as it was tiered with sloping ramps leading from one level to another. Later used as a quarry, and subjected to rock slides, the earlier temple of Mentuhotep quickly fell out of use and became forgotten.

Harwood traced the history of the first intermediate period. He explained how the Inyotef family dynasty became powerful enough to be proclaimed rulers, first of Upper Egypt, and then of all Egypt itself, under one of the Inyotef descendants, Mentuhotep II.

Mentuhotep Nebhepetre broke with the tradition of his ancestors, who were buried at el Tariff, and located his tomb opposite the ancient city of Waset (Thebes) in the bay at Deir el Bahri. Built in the shape of a "T", it served as both mortuary cult center and his burial place. Impressively designed with trees and gardens, the complex featured a unique layered appearance which was copied in Hatshepsut's later structure. Its courtyards were surrounded by many round and octagonal columns, and Harwood took us step-by-step through the ruined front gates, passed the now deserted gardens, and onto the platform of the temple itself.

Investigated in the early years of this century by the Metropolitan Museum, intact tombs for Mentuhotep's many wives, and some nearby tombs of his courtiers were found. Howard Carter himself even discovered a main burial chamber in the oft-used serendipitous way of having his horse stumble into a hole in the ground! Another shaft tomb, nestled into the cliffs behind the temple, was probably used for the royal burial itself, but Mentuhotep's mummy has never been located.

For additional information on this fascinating site, see the two-part article written by Harwood in the Summer/Winter 1994 & Summer 1995 issues of the *Ostrakon*.

HOUSE OF SCROLLS



MUSEUM REVIEW

THE NELSON-ATKINS MUSEUM OF ART IN KANSAS CITY

Reviewed by Stu Wier

About the Reviewer: Stu Wier has degrees in geophysical sciences. He currently works at NOAA in Boulder developing new ways to improve weather forecasts for the National Weather Service. Wier also worked on the Winchester Excavations in England in 1969, and is the compiler of the "Reader's Guide to Ancient Egypt" published by the ESS. His visit to Kansas City was occasioned by a wedding. "The artifacts were more interesting than the wedding," he said.

The Nelson-Atkins Museum has a small but good collection of sculpture and artifacts from the ancient Mediterranean area. There are about two dozen sculptures, sculpture fragments, reliefs, and artifacts from ancient Egypt, all of high quality. Nearly half of them are from the

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Old Kingdom.

Most imposing is a larger-than-life Old Kingdom limestone sculpture of a standing man, unfortunately missing the head. I did not know such monumental sculpture was made in the Old Kingdom, still less for anyone below the status of king. It may have been part of a family group, similar to other groups of two or more figures from royal and noble tombs and chapels at Giza. These groups frequently show the women with an arm around the waists of their male relatives, in a gesture which may indicate affection, support, approval, or some other tender quality. The workmanship of this piece is excellent, far superior to the poor surviving images of several important kings from the same period. We can suppose the kings had even finer statues and regret that they are lost. A few fine royal figures do exist, such as the statue of Khafre in Cairo and the figures of Menkaure found by Reisner buried in Menkaure's temple at Giza, and now in Boston.

There is also a statue of the official, Rawer, from the same period, carved in wood. It's about two feet high, and very well preserved, including the paint. I found the likeness entirely believable as a representation of a unique person, though the museum label claims it is a typical formal portrait of no particular individual. Of course, it does follow the formal style. Decide for yourself, if you go.

There are three low-relief panels from the Old Kingdom: two as mirror images flanking a tomb door and another with registers showing boat work. I was surprised to find that the Old Kingdom boatmen wore nothing but a belt. There is a nice stele from Abydos, about two feet high, with a typical offering scene. Part of the surface was protected from damage in some way in the past, and the paint is fairly well preserved. One can see an elaborate pattern of colored circles painted on the offering table - something which would never be perceived if the paint were missing.

Other sculptures include a fine head of Sesostris III, with his normal weary look, and a fine black basalt hawk from the Ptolemaic or Late Period. There are several bronze figures of gods from

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the Late Period, pretty typical, which is to say not really high quality. However, there are some other Late Period pieces of superb workmanship, notably a relief showing the pharaoh offering to Anubis.

For New Kingdom fans there is a surprise: two gold buttons or sequins said to be from King Tut's tomb. There is no explanation of how they got to Kansas City. There is also a common incised relief of young Ramses II.

These are only some of the objects on display. If you love Egyptian art and are in Kansas City for a day, this is well worth a visit. If you have not seen high-quality Egyptian artifacts before, I would especially recommend it. You may be delighted to find yourself in the presence of the real thing and surprised by the quality of

workmanship.

Located at 45th and Oak Streets, the museum is open 10 AM - 4 PM Tuesday-Thursday, 10-9 PM Friday & Saturday, 1-5 PM Sunday, and is closed Mondays and major holidays. Admission is \$4 for adults; \$2 for adult students, and \$1 for children age 6-18 (under 6 is free). Saturdays, admission to the permanent collection is free. Lunch is available in the Rozelle Court, a beautiful Italian Renaissance setting; dinner is served only on Fridays. Call (816) 751-1278 for information.



THE DENVER MUSEUM OF NATURAL HISTORY

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