

THE OSTRACON



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MERETATEN'S BATHROOM

by Barry Kemp

*About the author: Barry Kemp is Lecturer in Egyptology at the University of Cambridge, U.K. He has been Field Director of the Amarna Project for the past 18 years. Kemp has been conducting yearly expeditions to the area, uncovering new evidence about the structure of the city of Akhetaten and the Amarna period. He is a scholar and prolific author, having published numerous articles on Amarna and the Amarna Period in most of the archaeological journals that pertain to Egypt and the Near East. Kemp's popular book, **Ancient Egypt, Anatomy of a Civilization**, is an excellent comprehensive history of ancient Egypt.*

The North Palace at Akhetaten is one of the best known buildings at Amarna. Indeed, for most visitors to Amarna it is actually the only ancient building that they see.

The palace was originally excavated over two seasons by the Egypt Exploration Society (EES) between 1923 and 1925. The progress of the work was marred by the death, in the Assiut hospital on Christmas day 1924, of the director, F.G. Newton, who had contracted *Encaephalitis Lethargica*, an illness which made a widespread appearance in Europe in the early decades of this century. What he began was completed by Thomas Whittemore, an American archaeologist who subsequently followed a career in Byzantine studies and never put together the detailed report that was expected. Beyond two summaries published in the *Journal of Egyptian Archaeology* (Newton, 1924; Whittemore, 1926) and a survey of the wall paintings in the memorial volume of Newton (Frankfort, ed. 1929), nothing of substance has appeared. This is a serious omission. The North Palace is the most complete and coherent of 'palace' buildings to have survived from ancient Egypt, and its design is both full of interest and an impressive achievement in architectural conception.

Since beginning work at Amarna, several of us have devoted a good deal of time to preparing

a full and final report, but there is still a long way to go. One source of delay has been the common problem of finding that the further one gets into the subject, the higher is the standard aimed for. My initial idea was to compile a report in the style of the 1920s, such as Newton and Whittemore might have done, relying on such plans and records of their finds which have survived in the EES archives. However, this has looked increasingly like a policy of short-changing people who might buy and want to use what is bound to be quite an expensive volume. So, gradually, a policy has developed of re-examining the building and re-drawing the objects found - where this is feasible. On a number of occasions I have been back to the North Palace and made fresh plans and notes, sometimes requiring minor re-clearances. This process still has some way to go.

Visitors to the site are often told they are looking at Nefertiti's Palace. This is an invention, for no evidence has ever been found to link the building particularly to her. The original excavations produced quite a number of fragments of inscribed limestone such as columns, architraves, door-frames, and several stone-built architectural features. In addition to the names of the Aten and Akhenaten, many bore the name of the king's eldest daughter, Meretaten. It was noticed at the time of the discovery, however, that Meretaten's name had been recarved over a previous name. In 1988, Nicholas Reeves, in publishing inscriptions on three of the pieces of column which are now in the British Museum, was able to make out traces of the original name, that of Kiya, a leading queen of the mid-years of Akhenaten's reign (Reeves 1988). Therefore, the North Palace might with some justification be called Kiya's Palace, and the title of this paper, 'Kiya's Bathroom'. By the time the building was abandoned, however, Meretaten was the name inscribed on the stonework and this provides justification for using her name in what is, after all, only a modern convenience. What the Egyptians called the building we do not know at all.

Buried within the complicated plan, and easily overlooked, is a part which is essentially a domestic suite, a grander version of the style of the private rooms which occupied the rear part of the standard officials' house at Amarna (Figure 1). Its existence helps to demonstrate that this was also a lived-in palace, as do the remains of kitchens and workshops ranged along the southern side.

The whole domestic unit measures around 17.5 x 15 meters and lay on the south side of the palace's main columned hall. Its three doorways, one of them from the hall, opened into a long vestibule (14). Its roof was originally supported on a single line of six columns, now only represented by sandstone column bases. From this courtyard doorways opened along a line of five rooms. Behind them ran a long staircase (20) which, towards the west, had been supported on brick chambers filled with desert soil. Their solidity has ensured greater resistance to erosion over the centuries and so has helped to preserve the two westernmost rooms to a greater height than was the case with the rest of the walls in the area. One of these

(18) was a bathroom (Figure 2). It had been created out of a plain rectangular room, 2.2 meters wide and 4.4 meters long. The front part had been paved with bricks plastered over with mud, but over the rear part, and covering

an area roughly two meters square, the floor had been paved with irregularly shaped limestone slabs set in gypsum cement. Across the front was built a low limestone curb with a rounded top. A gap of 50 cm had been left in the middle to act as a doorway, in front of which a further stone slab had been set. Beside it on the west, a sandstone basin, its internal dimensions 50 cm square and 30 cm deep, had been set into the floor and plastered into place with gypsum.

A circular hole in the stone curb behind showed that the purpose of the basin was to collect waste water, which could then only be bailed out by hand. The edges of the basin had been stepped downwards around the top, presumably to receive a wooden lid when the bathroom was not in use. Where the stone pavement met the mud-brick walls of the room on three sides, the walls had been faced with a thick layer of mud plaster coated with gypsum which, when first uncovered, seems to have preserved its original top edge. This showed that the wall had been about 92 cm high (estimated from the photograph, Figure 2).

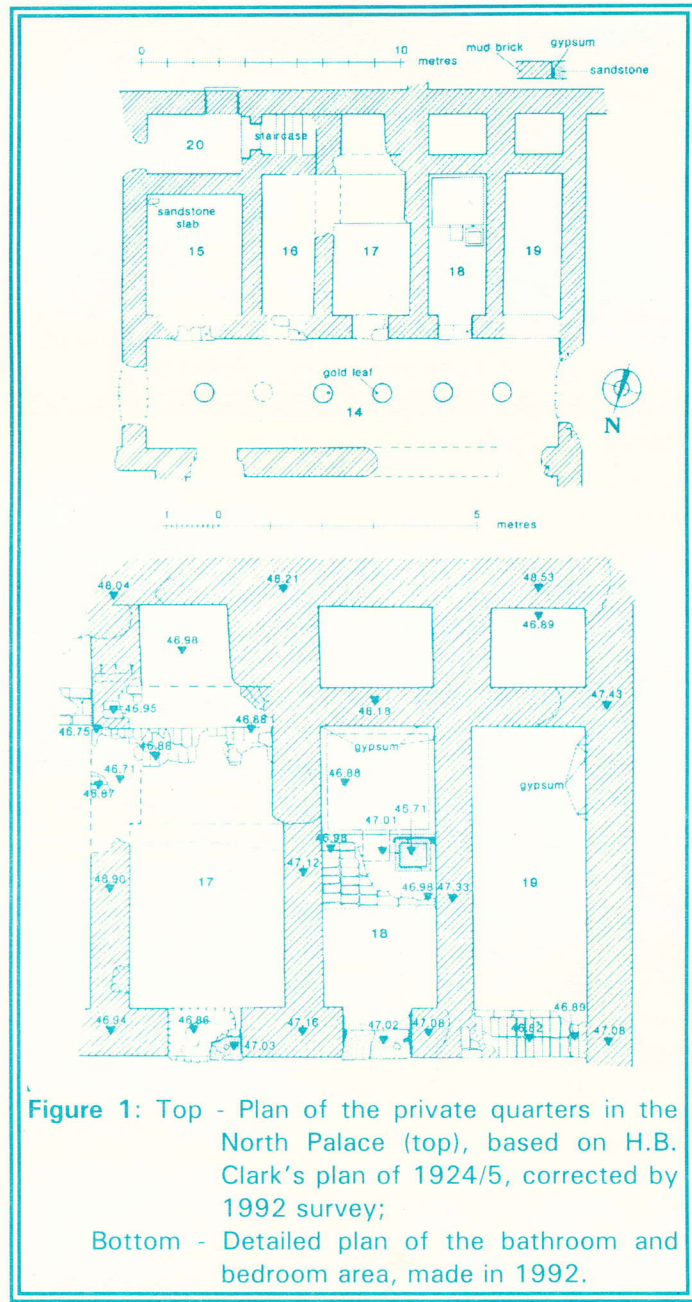


Figure 1: Top - Plan of the private quarters in the North Palace (top), based on H.B. Clark's plan of 1924/5, corrected by 1992 survey;
Bottom - Detailed plan of the bathroom and bedroom area, made in 1992.

These features duplicated, on a somewhat larger scale, what are obviously bathrooms in some of the larger private houses at Amarna. The house of the sculptor, Thutmose, had one, for example. Some of them used for their base

a spouted slab carved from a single piece of stone that looks rather like a modern shower tray, the water running away into a sunken pottery jar which could actually be located on the far side of the bathroom wall. The Thutmose example sloped down towards the outlet to ensure proper drainage, and this is something that is to be expected of the North Palace bathroom, although the surviving evidence cannot prove it. The simplicity of these arrangements, even in a palace, reminds

us that, unlike certain other peoples of antiquity, the ancient Egyptians took virtually no interest in architectural provision for domestic and urban drainage. We can only guess how these facilities were used, for I know of no tomb painting or other depiction which shows an ancient Egyptian taking a bath. We might guess that the privileged few who could afford a special bathroom were assisted in the cleaning of their bodies by a personal attendant, but in winter (when Amarna can be bitterly cold) did they use hot water? In one private house (number U33.1) the slab of stone which provided the bath tray also had an extension carved on one side in the form of a pair of circular depressions, as if to support two vessels or even to hold other items (Frankfort and Pendlebury 1933, 71, Pl. XXV.2).

The room on the left of the North Palace bathroom (17), although not nearly so well preserved, nevertheless retained a feature which also allows its purpose to be identified. Towards the rear the side walls have been stepped in slightly. This is the tell-tale sign of the presence of an alcove with slightly raised floor which normally served in ancient Egyptian houses to accommodate a bed. The excavation photographs of 1924/5 show that

the low platform then still survived but this has now vanished. On the original excavation plan both the room and alcove are made narrower than was actually the case, the east wall having largely disappeared. The true width of the room is 3 meters, and that of the alcove probably 2.5 by 1.8 meters.

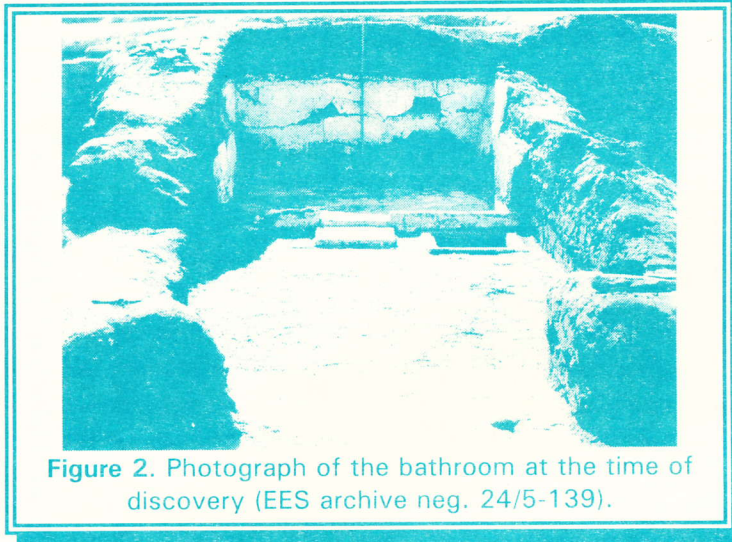


Figure 2. Photograph of the bathroom at the time of discovery (EES archive neg. 24/5-139).

Bedroom and bathroom were each flanked by three further rooms. The one beside the bathroom (19) had also been, at least in part, lined with gypsum

plaster. Traces of this can still be seen on the west wall, towards the back, where gypsum is caught in the vertical joints between several pairs of bricks. In the room at the opposite end of the row (15), which had a greater breadth than the others (ca. 4 meters), a sandstone slab, 25 x 40 cm, had been set into the floor on the southeast corner. If we look again for a comparison to the larger houses at Amarna, we will find that a closet, located next to a bathroom, sometimes accommodated a very simple lavatory: a seat of wood or stone resting on side supports and presumably served by a removable container, the equivalent of a modern chamber pot. The Egyptian Museum in Cairo displays (in one of the upstairs galleries) a fine example of a carved limestone toilet seat from Amarna house number T35.22 (Frankfort and Pendlebury 1933, 47, Pl. XLII.3). It is likely that one of these three rooms contained Meretaten's lavatory. The sandstone slab set in the floor of the easternmost room would form a suitable base for a removable vessel, but is located rather inconveniently close to the walls in what is otherwise quite a large room. The westernmost room is a more likely candidate, with its gypsum-plaster lined walls and location next to the bathroom - a situation preferred in the larger private houses.

The present appearance of this whole suite of rooms probably leaves us with a very inadequate impression of what it actually looked like when in use. There are many signs that all of the doorways had been fitted with stone door frames, and these might have been carved with hieroglyphs which featured the owners name. We know that some parts of the palace had painted walls and ceilings, but also that the survival of such decoration is quite exceptional. A significant clue was noted at the time of excavation in the bathroom itself. The gypsum plaster wall lining "was carelessly spattered with red and blue paint by the painters, who had not been at pains to rub it off." The most likely source of the paint is decoration on a layer of mud plaster on the walls above, which has not survived at all.

One would dearly like to know if the designs were geometric patterns or were more elaborate in subject. Whatever the details were, we are entitled to imagine the walls of Meretaten's private rooms alive with color and there may have been even richer decoration. Holes were bored into two of the column bases in the vestibule, almost certainly to support wooden poles, perhaps for a screen. In 1992, I brushed the sand away to take a close look and make notes and there, caught in the gypsum cement which had been used to anchor one of the poles, were tiny flecks of gold leaf. How sumptuous this place might have been!

Another intriguing stimulant for the imagination is provided by the staircase that runs behind the chambers. With a depth of 14 cm for each step, the whole flight could easily have climbed to 2.5 or 3 meters with room to spare for a landing. What did it lead up to? To a modern eye it seems natural, on finding a bathroom

and bedroom on the ground floor, to accept that this was a single-story building and that the staircase simply led up to a flat roof. One should not rule out the possibility, however, that the stairs actually led to an upper suite of rooms. A few of the larger private houses had a main bedroom and bathroom on the ground floor and second story rooms above. Meretaten could thus have possessed a suite of more private rooms above the ones that we see now. On the other hand, bedrooms of the alcove type such as was present here may regularly have been provided with a north-facing roof vent to enable cooler air to circulate. The presence of one of these vents would support the theory that this room was only a single story.

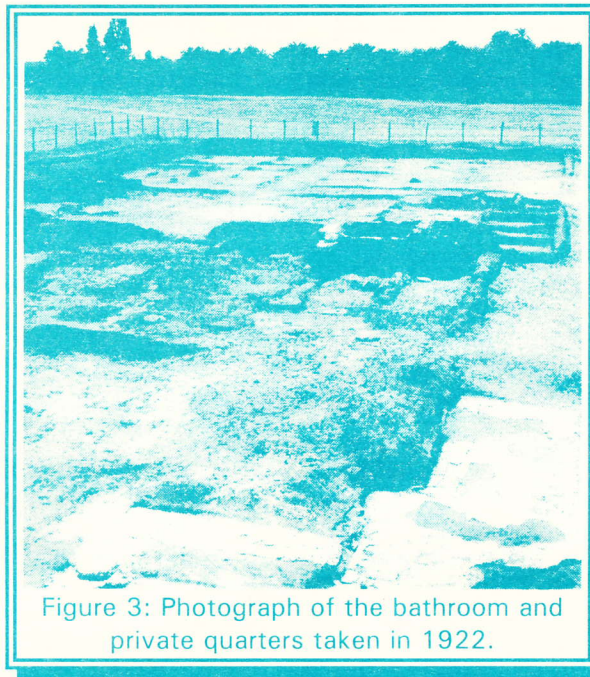


Figure 3: Photograph of the bathroom and private quarters taken in 1922.

There must have been a day in 1925 when the EES architect H.B. Clark, in the course of making his plan, had the privilege of standing for a while on the stone slabs on which, thirty-two centuries before, first Queen Kiya and then Princess Meretaten had also stood while taking baths. Sadly, anyone who today wishes to touch the past in this way, or would just like to appreciate a fine example of ancient Egyptian domestic facilities, will be disappointed. The subsequent combination of weathering and scavenging

villagers has removed most of the distinctive features. The walls still stand (Figure 3), but all that is left of the bathroom is the sunken stone tank (slightly misplaced) and a single floor slab, long ago pried up from its original place, lying loose on the surface.

It is now the plan of TARF (The Amarna Research Foundation) to begin the job of stabilizing those parts of the North Palace which are most vulnerable to further decay. The first step is to clearly identify the priorities

and to draw up a scheme that is commensurate with the available resources. This was done in September of 1996. Meretaten's private rooms were included, and stabilization here is not expected to be a big job. It is actually feasible to go beyond this, however, and to replace the stonework and plaster and bring the bathroom back to something resembling its 1925 condition. The ethics of doing this, however, are debatable. There is a fine line between carrying out necessary measures of consolidation, which add discreetly to the original masonry, and creating mock antiquities. It is probably better to be thankful that we do at least have photographs of what Meretaten's bathroom looked like, and to let one's imagination do the rest.

References

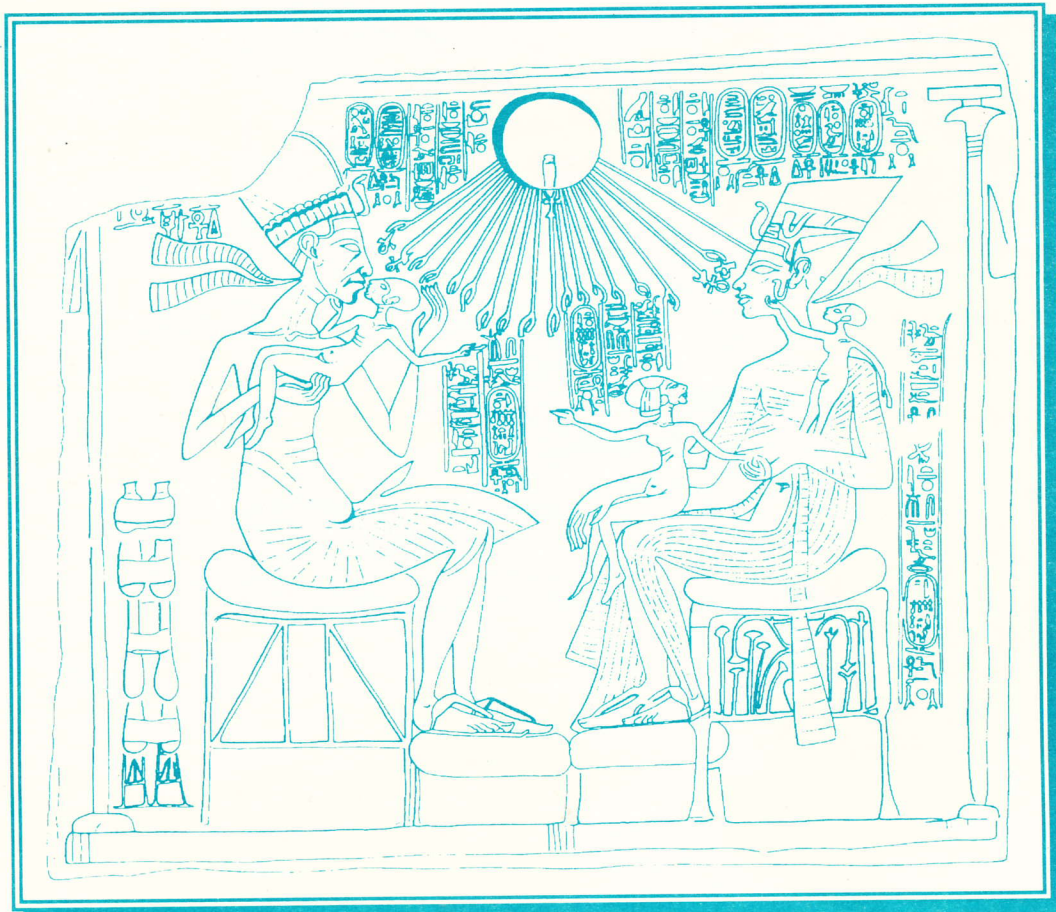
Frankfort, H., ed. (1929). *The Mural Paintings of el-'Amarneh*. London.

Frankfort, H. and J.D.S. Pendlebury (1933). *The City of Akhenaten, II*. London.

Newton, F.G. (1924). "Excavations at el-'Amarnah, 1923-24." *JEA* 10: 289-98.

Reeves, C.N. (1988). "New light on Kiya from texts in the British Museum." *JEA* 74: 91-101.

Whittemore, T. (1926). "The excavations at el-'Amarnah, season 1924-25." *JEA* 12: 3-12.



Akhenaten sits on the left, holding the eldest daughter and heiress Meretaten; Nefertiti sits opposite, with the second daughter Meketaten (soon to die) on her lap, and cradling the third daughter Ankhesenpaaten (later the wife of Tutankhamun) in her arms. Berlin Museum #14145.

(From Kemp, *Anatomy of a Civilization*)

NEW INSIGHTS ABOUT OLD PYRAMIDS FROM SIMPLE CALCULATIONS

By
Stuart Wier

About the Author: Stuart Wier has been a member of the ESS for five years. He was born in Kansas, and earned a degree in Physics at Duke University. He has a Ph.D. in Geophysics from Princeton, where he worked with Jason Morgan, the man who started "plate tectonics," the mathematical description of continental drift. Wier now works for the National Oceanic and Atmospheric Administration, Boulder, in weather forecasting. He and his wife, Pat, live in Boulder County with one dachshund, two children, three beehives, and four boats. His next project is a book, "The Native Trees of Colorado."

This article is based on investigations originally published in *The Cambridge Archaeological Journal*, Vol. 6, No. 1 (April), 1996. pp. 150 - 163. It has since been featured in magazines or newspapers in England, France, Germany, The Netherlands, and Egypt.

Standing before the Great Pyramid at Giza, Napoleon, like many others before and since, wondered how such a vast structure was made. Being of a practical mind, Napoleon set himself a problem: how to compute the volume of the Great Pyramid. He did so and went on to find that the stones in the pyramid were sufficient to build a decent sized wall all around the perimeter of France.

This simple computation changes the character of the question of how the pyramids were made. Instead of pondering a unique structure of a size and form unlike anything we encounter in daily life, it is possible to reduce the matter, of volume at least, to something on the scale of a vegetable garden. Well, thousands of vegetable gardens, but still something we can judge by the terms of daily life.

Fall 1996

In engineering, mathematics, and physics, one becomes accustomed to making such changes in point of view as an aid to solving a puzzle. A few simple calculations - using what is known for sure, with reasonable assumptions for things we do not know exactly, as well as applying established principles and avoiding the things we don't know - often reveals more than you expect at first. These "back-of-the-envelope" calculations will not tell you everything, but you will learn something and have a leg up in further work.

An important factor that really helps these kinds of calculations is what the physicist Eugene Wigner called "the unreasonable effectiveness of mathematics in the natural sciences." "Unreasonable," because there is nothing in nature, on the surface at least, that suggests that natural processes follow simple mathematical formulas rather than vague general principles, or even, as the Egyptians thought, active conscious volition of gods to cause routine daily events such as the sun rising. In fact, the exact position of the sun in the sky can be predicted mathematically for the future, with almost any degree of accuracy you want, even if you don't worship Ra.

An example of the use of known principles to investigate something that was not testable at the time appears in Robert Adair's book, *The Physics of Baseball* (Harper and Row, 1990). He explained the effect of airflow around a baseball. This airflow makes curveballs among, other things, possible. He predicted that because of less air in Denver, curve-balls would curve less, making hits more common. And he showed that hits, which in other parks would land inside the fence, would travel about 20 feet farther in Denver since the drag on the ball is a little less. Now 20 feet is not a big change in over 300 feet of travel, but it can change a fly ball to a home run. When you count how many balls are caught near the back fence, you can conclude that home runs will be more common in Denver. In 1995, 241 home runs were hit in Coors Field, more than any other ballpark in the major leagues. Dante Bichette hit 31 homers in Coors Field, and 9 on the road.

Now what can be learned about the pyramids of Egypt using simple calculations? The pyramids are an excellent subject for this kind of investigation since their structure is so simple. Simply moving and assembling the material was the dominant factor in their construction.

Start with the fact (not very controversial) that the pyramids were built, and that they were built by human power alone. Given that little is known about how they were built, let us see what still may be determined about their construction.



The Great Pyramid of Giza circa 1930
(From Jenkins *The Boat Beneath the Pyramid*)

This investigation is limited to the solid masonry pyramids of the Old Kingdom, the largest and presumably the most demanding pyramids to build. Because the Great Pyramid of Khufu at Giza is the most precisely measured, and also because it is the largest and most famous pyramid, it will be the focus of our discussion. Results are also available for all the surviving large masonry pyramids of the Old Kingdom. At least four large solid masonry pyramids preceded Khufu's pyramid over a period of a century.

First of all, it is clear this pyramid is made of blocks of a simple shape, piled up in horizontal layers. Overlook for now the details, such as internal passages and the external casing of smoothed Tura limestone. Treat the pyramid as if it were a uniform pile of the core material, Mokattam limestone, from a quarry just south of the Sphinx. In fact, only a very small percentage of the total volume is anything other than that.

We do not know how long construction lasted for this pyramid. Khufu is said to have reigned 23 years, and so far as we know that is

correct. Additional evidence may well exist as to the time spent for construction of this pyramid, but is perhaps not widely published: masons' marks perhaps, or the time span indicated by seals on wine jar fragments in construction debris. There are well-known

year marks inside Khufu's pyramid, fairly well up above the King's Chamber, I recall, with "year 17" indicated; that is not inconsistent with a 23 year construction span. Perhaps the pyramid was finished in less than 23 years; perhaps it was finished after he died. Both are entirely possible. Let's assume the

construction took 23 years, or 8400 days, for a nice round number. If someone later finds a more accurate number of days used in construction we can change the conclusions by simple proportion. Overlook the fact that the ancients surely took time off work for any of a number of reasons. Since we don't have exact knowledge of how long construction lasted, there is not much value in adjusting it by ten or twenty percent!

Building the pyramid involves these basic processes: quarrying stone from the solid walls of the quarry, moving the stone to the building site, lifting stone to the work area as the pyramid rises, and installing blocks on the pyramid. Each block is not the same shape and must have been individually installed.

Exactly how were the stones lifted? We have yet to find any definitive evidence. The most common proposal is ramps of earth sloping from the quarries to the building site. Small stones could be carried by a few men with long poles, but most of the stones are too large for that. The big stones probably rode on

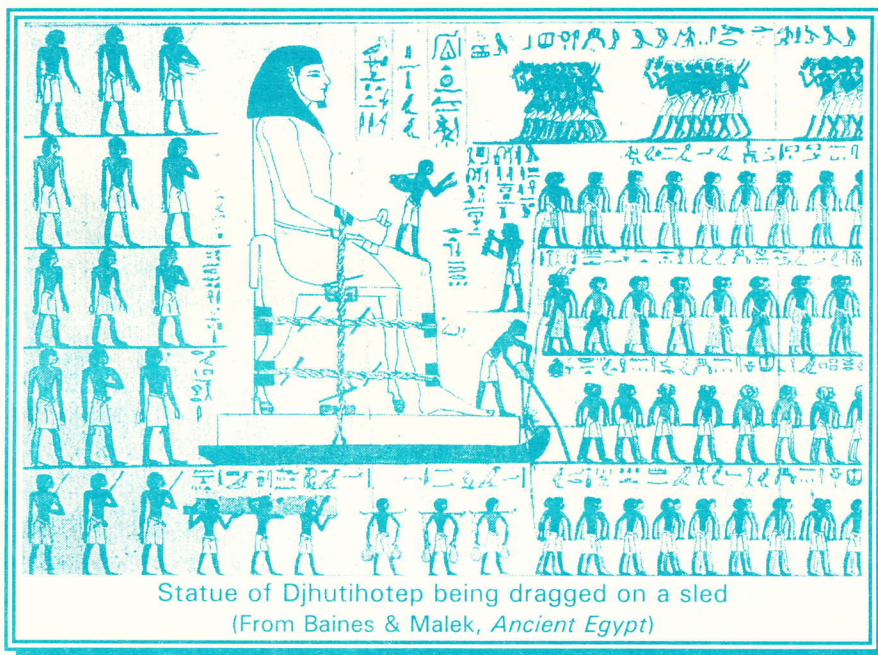
wooden sleds and were dragged by however many men it took to move them.

Dragging heavy wooden sleds over rough stony ground is very difficult, but the Egyptians probably thought of a few refinements, especially since the pyramids of Giza followed some 80 years of previous pyramid building. Pulling heavy stones for 80 years gives you a lot of time for thinking up ways to make it easier.

One plausible scheme is a track of cross-ways wooden timbers. Wood slides on wood pretty well, and even better if you put a little water mixed with clay under the sled runners. The Egyptians had lots of water and clay at hand since the Nile river was at the bottom of the hill.

Though we have no ancient pictures of pyramid construction, many ancient Egyptian images survive of moving heavy stone objects in other contexts. They are always on wooden sleds, and usually someone is pouring a liquid under the runners. Wooden tracks of this kind, surrounded by dried clay (appropriately enough), have been found *in situ* at the pyramids of Lisht. One of our own ESS members, David Pepper, did a little hand digging (with permission) along the hallway where a huge granite Apis bull sarcophagus had been dragged into the Serapeum (the sarcophagus got stuck in a hallway, and it's still there). The first thing he hit below the loose sandy surface was a cedar timber.

It is possible to estimate the friction in moving a particular weight on such a sled. The frictional drag is about 20% of the weight of the load, for dry wood sliding on wood, and less if lubricated. One needs to actually try this out with the woods, sleds, tracks, and clays the ancients used, to get a better estimate. There are supposedly accounts of recent native workers moving heavy stones with surprising ease, but I would need to see the original reports of such things.



To complete the picture of what we know about the problem, Khufu's pyramid was originally about 480 feet high - almost as high as a 50 story building - and 756 feet along each of the sides of the square base. The volume was very close to 2.6 million cubic meters (and each of

those cubic meters weighs in at three tons). Most of the blocks are about a meter across; this is the basis for the estimate that the Great Pyramid contains about 2.6 million blocks. There is no way to count the blocks since most are buried inside.

Right away we can reach a powerful conclusion. Divide the volume of the pyramid by the number of days spent in building; the result is 309 cubic meters of stone to install per day. Any building construction technique proposed for Khufu's pyramid must be able to deliver and install at least 309 cubic meters per day, day in and day out, for 23 years, or even more if fewer days were used.

It is reasonable to suppose that construction started at even higher rates, with lower rates

later on, thereby avoiding congestion at the top of the pyramid as construction neared completion. Any number of construction rate schedules can be contrived to match the requirements. A construction rate schedule is a list of how much volume of stone is to be moved each day as the pyramid is built. The reasonable ones all start at more than 315 cubic meters per day, but there is little value in exceeding 500 cubic meters per day, given the time duration we are using. That is a great amount of stone to move in a day. At these construction rates, the space occupied by the Denver Museum of Natural History could be filled with solid stone in under four months.

Since everything about these computations is well known (except for the building time), the rate of construction necessary to build the Great Pyramid is the best determined conclusion of this work. If you can cut, move, and install 350 cubic meters of limestone every day, you can build the Great Pyramid in 23 years.

We now turn to the major construction tasks other than quarrying, lifting and horizontal transport. These can be studied by the principles of physics. The energy needed to lift the stones to where they lie in the pyramid can be computed. In fact, one single formula gives the total such energy for the entire pyramid. Dividing this by the number of days and the amount of lifting energy an unassisted man can provide in one day shows that some 1250 men on the project are all that is required for the lifting demands of the construction process. This does not include the unknown inefficiencies of an unknown process. But even if we double or triple the men required to account for inefficient methods, we still come up with a reasonable answer to the instinctive initial reaction that lifting all that stone must have been mighty hard. A thousand men can do a lot of work in 23 years.

Given the volume of stone to move each day from the construction schedule, we easily find the weight of stones moved per day. From the weight and coefficient of friction we get the

force to move the stones. From the force to overcome friction, and the distance from the quarry to the building site (about 600 meters for Khufu's pyramid), we get the amount of energy or work to move the stones. We cannot say exactly how much wood a woodchuck could chuck if a woodchuck could chuck wood, but we can say how many men were required to haul the stone from the quarry to the point of installation, given an estimate of the amount of work a man can do in one day. If lifting is also included, we add that to the amount of work to be done each day. It is not necessary to follow or repeat these calculations to appreciate the conclusions.

So from the construction rate at each level from the schedule, we compute the number of men required for moving the blocks, assuming sloping ramps were used to lift the stones. The maximum number is about 6900 men when the pyramid is 110 meters (360 feet) high. At that level a lot of the transport work is going into lifting as well as overcoming friction. At the base, during initial construction, some 5500 men are required. More workers are needed higher up to provide lifting energy.

Other workers were needed to cut the stones from the quarry and install them at the pyramid. Here we are going to have to make some reasonable guesses. Suppose that five to ten men could quarry a cubic meter of stone each day (that's a measure of volume; we're not suggesting they cut out exact meter cubes!) and that two to four men were required for final cutting and installation on top of the rising pyramid. Better values could be reached by actually setting men to work using the old techniques; experienced masons would be preferable. Again, given the construction rate schedule we can then see how many men were needed for these tasks. The maximum number of men needed for quarrying and installation at the beginning of construction, when the construction rate is a maximum (400 cubic meters per day), is 2800 to 5600 men.

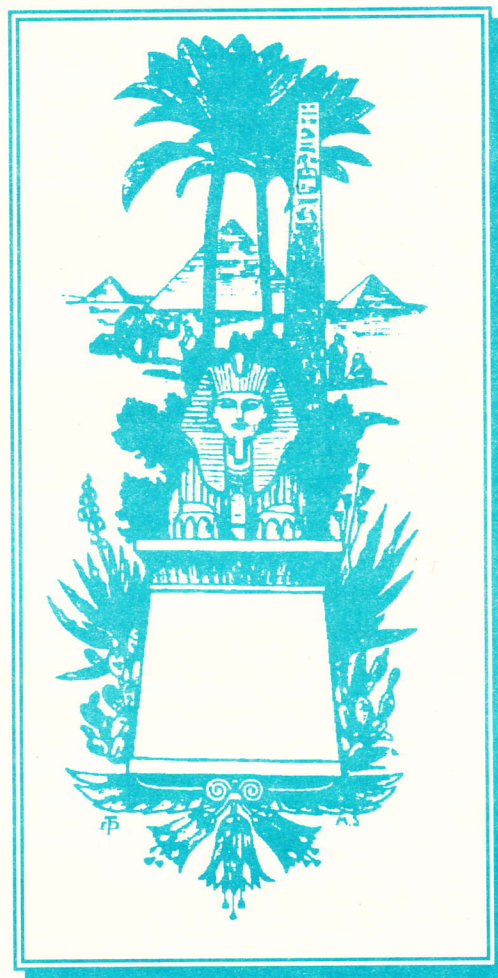
In fact, if you use the proper construction schedule, you can build the pyramid with a constant-sized workforce of some 8,300 to 10,600 men. Men are shifted from quarrying and installation to transport as the pyramid rises. The construction rate drops, but the demands of lifting increase. The construction rate schedule starts at about 400 cubic meters per day and smoothly and gradually drops over 23 years to about 225 cubic meters per day. At the very top, the manpower and construction rate drop to very small values, with only a few men needed to put the final stones in place.

As a purely preliminary estimate, fewer than 11,000 men would suffice to build the bulk of the Great Pyramid in 23 years. That is less than 1% of the estimated population of Egypt at the time.

This figure of 11,000 men does not include the manpower needed to build the internal passages, nor to quarry the granite and basalt (in Aswan, hundreds of miles up-river) used to line the passages, nor the shipwrights and seamen for the ships to carry stones from Aswan to Giza, nor men to make the associated temples, causeways, housing, or harbors, nor those raising food for the workers. These things are far outside the scope of this sort of investigation. It is clear that this must have been a very large community, probably the largest community in Egypt. It seems that organizing and managing the entire operation was the challenging demand, and figuring out how to cut and move stones was only part of the problem.

These results throw light on some other pyramid construction notions. The idea of only building during the time of the Inundation, the annual wide-spread Nile flood which lasted about 100 days, when farm workers were available, is popular but not practical. That shortens the building time so much that some 35,000 to 45,000 workers would be needed to finish the pyramid in 23 years. Gathering 40,000 workers from all over the country for 100 days, and then sending them home,

seems highly inefficient and impractical. Certainly there may have been a boost in construction at inundation time, but no major change in activity. Likewise, transport demands were so high that pyramids were probably built very near the quarry. Moving the stones requires the largest amount of manpower. Double the distance to the quarry, even just another 600 meters, and you significantly increase the manpower needed. After a century of pyramid building, the ancient architects surely knew these things very well indeed.



I envision pyramid construction proceeding in this way: the architects, priests, or officials gathered together and determined the size of the pyramid to build, asking "How long can we expect the King to live?" and "How many men can we get, full time?" They found a location with adequate building stone and good foundations, and which suited the religious

motivations of the project, as well as whatever wishes the King had. Using rules-of-thumb they knew how many men to start quarrying and how many to transport, and also how to shift those tasks as the pyramid rose. It is possible, according to Robert Lowdermilk of the ESS and a student of the pyramids, that if the King lived longer than expected the pyramid could be incrementally enlarged by adding a shell around the outside, perhaps even several times. Internal structure would show evidence of this practice if we could get at it. This would explain how pyramids often seem to reach completion about the end of the reign of the King.

Why were the pyramids built? Now there's another question...

Summary. The intent of this investigation was not to determine the definitive size of the building crew that built a pyramid. Instead, the purpose was to outline an approach, showing what is known and what is unknown, and to use this approach to estimate construction rates and make preliminary estimates of the workmen's crew size for the core of the pyramid. The construction rates are well established; the crew sizes much less so.

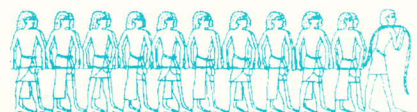
Given the lack of accuracy in our knowledge of many factors in the calculations, it is not possible yet to make really good estimates of manpower needed for pyramid construction. The results are reliable enough, in my opinion, to give some idea of the fraction of Egyptian society that was required to build large pyramids, a fraction ancient Egypt could have supported, given the will to do so.

I hope this work is a starting point for investigations that will supply more precise values for the length of times of construction, the manpower required to quarry and install stone, and the friction encountered in dragging the blocks. Egyptian archaeologists should keep these matters in mind, and keep on the look-out for wooden track and sled remains, for quarries near pyramids, and paths connecting them to the pyramids.

Modern re-creations of the ancient masonry practices help to provide important manpower values needed, although they lack both details of those processes and the refinements which the ancients must have employed, based on their decades of experience. Without a time machine, the best way to determine the friction involved might be to build a sled and track, using the exact same materials as the ancients, and pull large stone blocks along it, measuring the force. It is most useful if the contact surfaces and lubricants exactly duplicate the original materials.

New Results. I have just found better measures of the amount of effective work a man can do in a day, one of the key factors in the manpower computations. The source is *Mark's Standard Handbook for Mechanical Engineers*, Ninth Edition, McGraw-Hill, 1988. The new value is 75 Joules per second, averaged for an 8 hour day, which works out to be several times more work than the estimate I originally used. This naturally reduces the number of men required for lifting and dragging blocks. In fact, the total manpower, using the constant-manpower model, drops by more than half, to the range of 2,900 to 5,100 men. The construction rate shifts a little, decreasing from 340 cubic meters per day at the beginning to 250 cubic meters per day in the 23rd year. I suspect that the actual average rates of work are between this measure for modern men, and the lower value I used in the original calculations. The workforce building the bulk of the Great Pyramid appears to have been, so far as can be estimated now, more than 2,900 men and less than 10,600 men. In any case, there is a strong argument that the pyramids were built with a surprisingly small number of workers.

For details please see the complete original report (in the *Cambridge Archaeological Journal*). For references on the pyramids see the original report or the bound *Reader's Guide to Ancient Egypt* published by the ESS.



**MERESANKH III
FOURTH DYNASTY PRINCESS
AND QUEEN**

**By
Bonnie Sampsell**

About the Author: Bonnie Sampsell is a member of the ESS and the American Research Center in Egypt. Prior to retirement she was a professor of biology (genetics). She has a B.A. in physics from Miami University and a Ph.D. in genetics from the University of Iowa. She and her husband have traveled extensively throughout the world, and she has traveled in Egypt three times with our old friend Mohammed Shata.

Most visitors to the Great Pyramid in Egypt are surprised to discover that it contains no inscriptions honoring the name or life of its illustrious builder, Khufu. Vandalism and the ravages of time have also destroyed the pyramid's temples and causeway, leaving only a few fragments with the king's name. Moreover, since only one small statuette of him has ever been found intact, this famous king remains a shadowy personality.

These same visitors would also be surprised to learn that evidence about some of Khufu's relatives has survived the ages more successfully. From the inscriptions and objects deposited in their tombs in the cemeteries east and west of Khufu's Great Pyramid, we can obtain information about the identities, titles, and relationships of these ancient courtiers. One person who has been revealed to us in this fashion is Meresankh III, a granddaughter of Khufu and wife of Khafre. Her well-preserved "House of Eternity" was discovered and excavated by the Harvard-Boston Expedition under the direction of George Reisner in 1927. This tomb offers us an amazing picture of her family and her life during a period of Old Kingdom grandeur. Furthermore, the tomb is now open to the public on a limited basis, so it deserves our renewed attention and study.

Meresankh's parents, Kawab and Hetepheres II, are both portrayed in her tomb. Kawab appears as a portly middle-aged man with the inscription, "Her father, prince, King's eldest son of his body, Chief Lector-Priest, Director of Divine Offices, Assistant of Duwa, Kawab." Hetepheres is described as, "Her mother, daughter of the King of Upper and Lower Egypt, Khufu, Great Favorite Hetepheres." The identity of Kawab's mother was deduced by W.S. Smith from fragments of an inscribed panel that were found in Kawab's much-damaged mastaba. A few of the hieroglyphs comprising her name remain and appear to have spelled out Mertiotes along with the words "who bore him to Khufu." In this way, we learn explicitly that both of Meresankh's parents were children of Khufu and possibly full brother and sister (see genealogical chart at end of this article).

In spite of this clear acknowledgment of Prince Kawab as Meresankh's father, she is repeatedly referred to in inscriptions throughout the chapel as a "King's Daughter" or as "King's Daughter of his body" and "King's beloved Daughter." Nowhere in the tomb is this (fatherly) king identified. George Reisner explained this apparent contradiction by citing several other examples in which grandchildren of Khufu are given these titles, even though their fathers were only princes, and he suggested that the title was only a courtesy. This practice was apparently confined to these grandchildren and was not common throughout the Old Kingdom. This possibility should be a warning to us, however, that not all information in the ancient inscriptions can be taken literally!

The following story of Kawab and Hetepheres has been developed from many bits of evidence. Kawab, as eldest son, was the Crown Prince and heir apparent to Khufu, but he predeceased his father. We believe that his widow then married her half-brother and Khufu's successor, Djedefre. Djedefre built his pyramid at Abu Rawash, but Hetepheres (ignoring the double mastaba of Kawab in which a burial chamber had been prepared for

her) began to prepare another tomb for herself at Giza in what is designated Mastaba G7530/40. Evidence that Hetepheres did become Djedefre's Queen comes from her titles of "King's Wife" and "she who sees Horus and Seth (the king)" which appear in Meresankh's tomb, although the only reference to the king himself occurs in the name of an estate above an offering bearer in this tomb.

It has been proposed that Meresankh died unexpectedly, and that her mother then directed that an offering chapel and burial chamber for her daughter be dug beneath her own mastaba. She also ordered the large black granite sarcophagus on which an inscription was already carved be used for her daughter, and she had two additional vertical lines of carvings added in order to rededicate it to the younger woman. These say, "I have given (it) to the King's daughter and wife Meresankh." This sarcophagus has been moved from the tomb to the Cairo Museum.

The very close relationship between Hetepheres and her daughter is a prominent theme in the tomb. In addition, visitors who are accustomed to seeing Old Kingdom tombs in which women are only portrayed in the subsidiary role of wife, mother, daughter, or sister to the male tomb owner will be struck by the fact that in this tomb it is Queen Meresankh who is shown as the main figure in the wall scenes, often in situations comparable to those featuring men in other tombs.

Although the offering chapel and tomb of Mastaba G7530/7540 were solely dedicated to and occupied by Meresankh, she is repeatedly portrayed in association with her mother in the wall decorations and the statuary of the tomb. For example, Hetepheres appears in the scene showing Meresankh and her children, including

Nebemakhet, the eldest son, two other sons called Duware and Nyuserreankh, and a daughter. None of Meresankh's sons became king of Egypt, but Nebemakhet (like many princes) held a number of important offices. He is described in his own tomb as "The hereditary prince, King's son of his body, Chief Ritualist, Scribe of the Divine Book of his Father, Eldest of the Senwt House, High Priest, Sole Confidant, [and] Master of the Secrets of his Father."



Another scene that involves both Hetepheres and Meresankh shows the two ladies being punted or poled through a swamp in a papyrus skiff. This scene, which is somewhat reminiscent of the hunting and fishing scenes in the tombs of various nobles, may actually represent a religious ritual. The inscription

reads, "She pulls papyrus for Hathor in the marshland, with her mother. They see every good thing which is in the marsh." Meresankh is described in another inscription as a "Priestess of Hathor." The cult of Hathor was especially popular with royal women during the Old Kingdom. Both Meresankh and Hetepheres are also described as "Priestess of Thoth" and "Priestess of Bapefy." These sacral titles are not as common as that of Priestess of Hathor and only two other Fourth Dynasty women are recorded as bearing these titles, Khamernernebtly I and II (another mother and daughter pair who were wife and daughter respectively to Khafre). While these positions as priestesses may have been entirely honorary, there is also the distinct possibility that the royal women played an active role in these cults, officiating on feast days if not on a daily basis.

Since we see members of Meresankh's family, including her mother, father, sons, daughters and male servants, it seems curious to us that

her husband (the king) is neither pictured nor named in any of the surviving material. Only in the tomb of her son do we find evidence (again in the form of the names of estates providing funerary offerings) pointing to Khafre as the king whom she married. This failure to name her husband might tempt us to indulge in speculations about family feuds, but comparisons with other tombs suggests this was not the case. Reviewing the excavation reports of a number of royal tombs spanning the reigns of several kings of the Fourth Dynasty, I found that the titles of "King's Son," "King's Daughter," "King's Wife", and even "King's Mother" appear frequently WITHOUT any indication of which king was involved. In fact, the clear indication mentioned above, that Khufu was the father of both Kawab and Hetepheres, seems to be the exception rather than the rule.

The offering chapel for Meresankh contained a variety of statues, some of which were carved directly in the living rock while other ones were free-standing. One statue that has been reconstructed from several large fragments is now in the Museum of Fine Arts in Boston; it shows Hetepheres and Meresankh (who are clearly identified by inscriptions on the base) standing side by side. The mother has her arm draped over her daughter's shoulder. Two other pair statues were cut into the wall of the offering chapel flanking the false door: in one pair, each of the two women has her inner arm around the other one, while in the other pair, they hold hands. These statues are uninscribed, but Reisner's suggestion that they both represent Hetepheres and Meresankh is very plausible.

Also unidentified are the ten individuals in a series of rock-cut statues which nearly fill one

wall of the chapel. At the right end of the series, three adult women are portrayed and Reisner proposed that they all represent Hetepheres. In the center are four adult women with similar dresses and wigs who he suggested are Meresankh. At the left end of the group are three younger figures, two of them very small, which may be Meresankh's daughter(s). If Reisner's hypothesis is correct, the statues repeat the mother/daughter motif with Meresankh being portrayed in both roles.

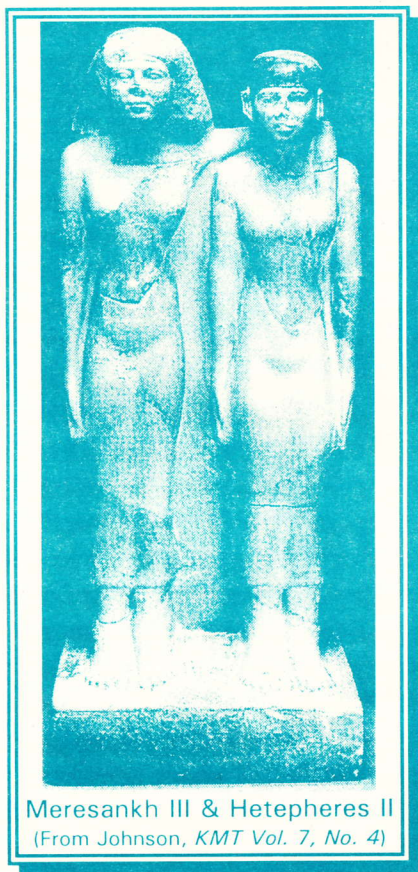


Meresankh III, granddaughter of Khufu
(From George B. Johnson, *KMT* Vol. 7, No. 4)

By now, we might ask whether the decorations and statues which repeat the mother/daughter theme were simply the memorials of a loving mother grieving for her daughter or whether they have a deeper significance. A clue may be found in the comprehensive study of the institution of "Queenship", in which Lana Troy provided the following summary of the role of queens in the Egyptian system. After noting the centrality of the concepts of resurrection and regeneration in the ancient Egyptian religion, as for example, exemplified by the daily death and rebirth of the sun god Re, she describes how the king, as both an intermediary between the gods and men and also as a divinity himself, portrays the concept of regeneration through his identification with Horus (son of Osiris) during his lifetime and his identification with Osiris after his death. By the queen's association with the pharaoh, she too comes to represent goddesses, such as Hathor (the mother and daughter of Re) or Isis (mother of Horus and wife of Osiris). Thus representations of queenly mother/daughter pairs are also symbols of the hoped-for regeneration and are particularly appropriate symbols to be placed in a tomb's offering chapel.

Most of the royal tombs at Giza were found in a plundered state with few or no human

remains, but the Meresankh Tomb proved an exception. The modern excavators found a pile of unwrapped bones lying in the black granite sarcophagus. These were examined by Dr. Douglas Derry who judged them to have belonged to a woman who died at age 50 or older. Other inscriptions in the tomb suggest that Meresankh died in the first or second year of the reign of Menkaure. From these dates, her estimated age at death, and the length of the reigns of the various kings during the Fourth Dynasty, we can calculate that Meresankh was about 16 years old when Djedefre succeeded Khufu (assuming, of course, that the bones in the tomb really were those of Meresankh and not the result of some later intrusive burial).



Meresankh III & Hetepheres II
(From Johnson, *KMT* Vol. 7, No. 4)

While we can reconstruct with some confidence the family relationships of Meresankh and many details about her life, we can only speculate about the extent to which she and Hetepheres may have been involved in any dynastic struggles after Khufu's death. Was Hetepheres already married to Djedefre at

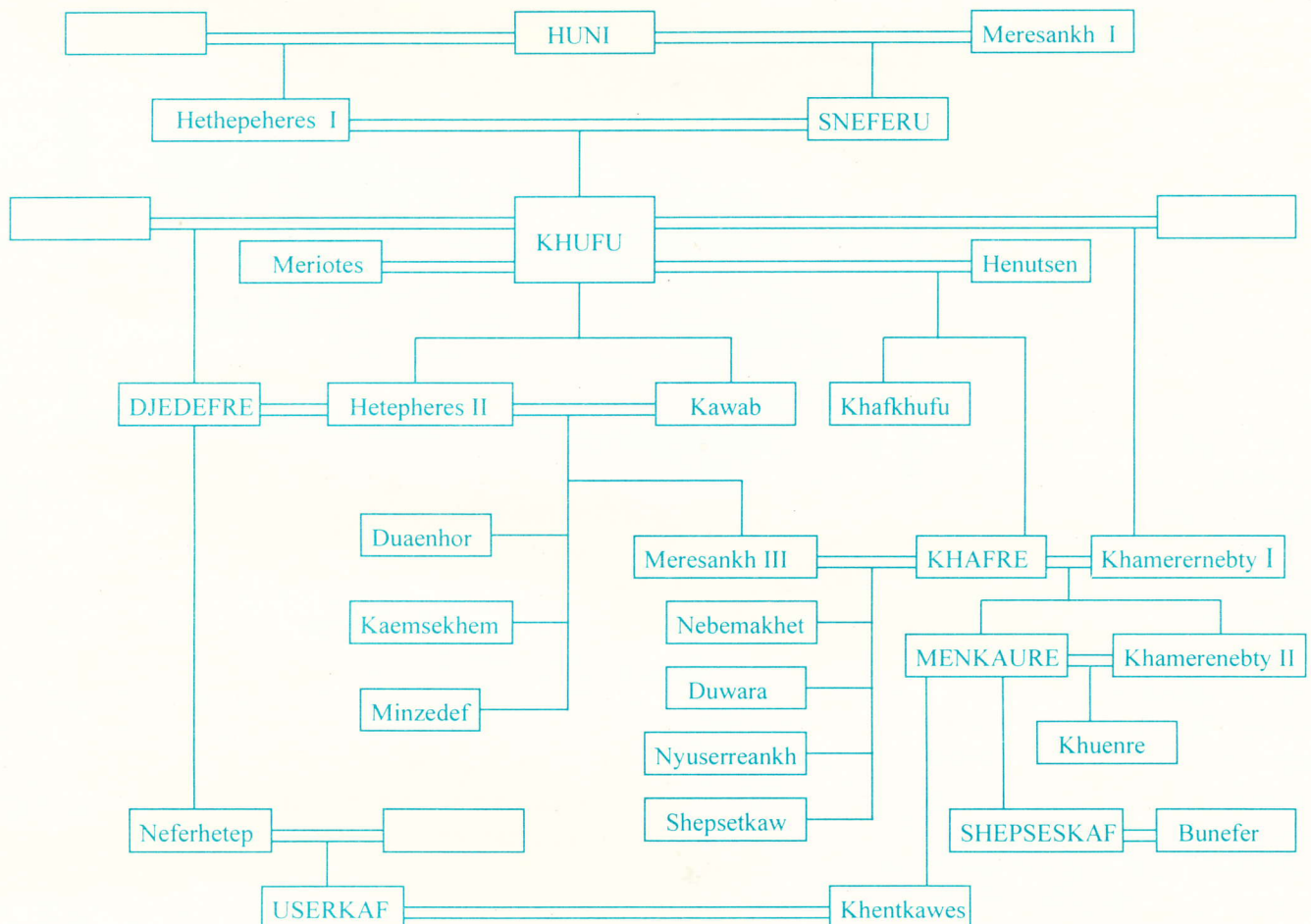
that time, or was their marriage part of a power struggle? Was she forced into the marriage or did she acquiesce willingly, perhaps using her position as Khufu's eldest daughter to influence the succession? Meresankh, at age 16, was perhaps too young to participate in this struggle, but when Djedefre died after a reign of only eight years, Meresankh's marriage to Khafre, another son of Khufu by Queen Henutsen, may have been important in returning the throne to the other branch of the family. Many elements in Meresankh's tomb suggest that both she and Hetepheres possessed significant wealth and prestige and, consequently, power. Were they any less hesitant to use it than later queens would be? We can speculate plausibly to fill in certain gaps in the story of Meresankh, but some mysteries must remain forever unless future excavations provide more evidence.

REFERENCES

- Clayton, P. *A Chronicle of the Pharaohs*. London, 1994.
- Dunham, D. and W. K. Simpson. *The Mastaba of Queen Mersyankh III G7530-7540*. Boston, 1974.
- Dunham, D. "A Statuette of Two Egyptian Queens." *Bulletin of the Museum of Fine Arts* Vol. XXXIV, pages 3-5. Boston, 1936.
- Hassan, S. *Excavations at Giza, Vol. IV*. 1932-33. Bulaq, 1943.
- Porter, B. and R. Moss. *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings, Vol. III*. Memphis, Part 1. 2nd Edition. Oxford, 1974.
- Reisner, G. A. "The Tomb of Meresankh, a Great-Granddaughter of Queen Hetep-Heres I and Sneferu." *Bulletin of the Museum of Fine Arts, Vol. XXV*, pages 64-79. Boston, 1927.
- Reisner, G. A. *A History of the Giza Necropolis, Vol. I*. Cambridge, MA, 1942.
- Reisner, G. A. and W. S. Smith. *A History of the Giza Necropolis, Volume II: The Tomb of Hetepheres*. Cambridge, MA, 1955.
- Simpson, W. K. *The Mastabas of Kawab, Khafkhufu I and II*. Boston, 1978.
- Troy, L. *Patterns of Queenship in Ancient Egyptian Myth and History*. Uppsala, 1986.

NOTES ON THE GENEALOGY OF ANCIENT EGYPT'S FOURTH DYNASTY

- Names of all kings are CAPITALIZED. Huni was the last king of the Third Dynasty; Userkaf was the first king of the Fifth Dynasty.
- Married couples are linked by double horizontal lines. Hetepheres II married Kawab first (1), then Djedefre (2). Queens married to the same king may have been sequential or contemporaneous.
- Children are attached to their parents by a single vertical line. If only one parent is known for certain, the vertical line runs to that parent alone.
- Each king had more children than are shown and possibly additional wives.
- A blank box indicates a person whose existence has been deduced, but whose name is not known.



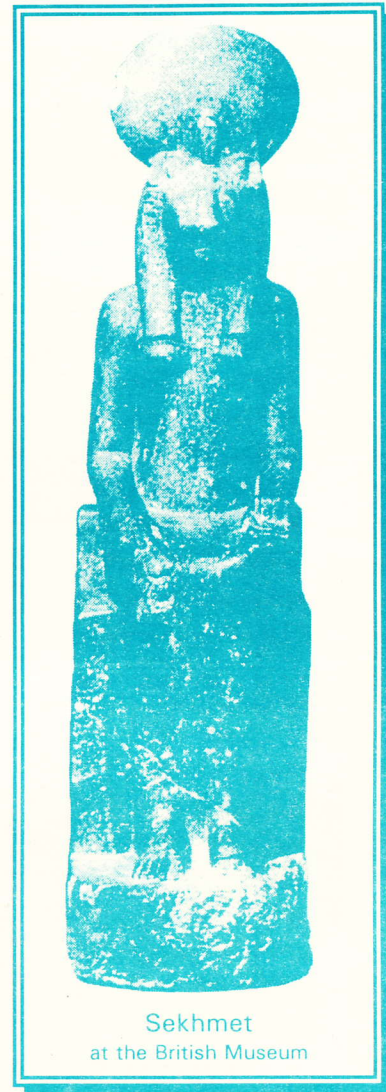
FELINE DEITIES OF ANCIENT EGYPT

By
Linda Engel

About the Author: Linda Engel is a long-time member of ESS who has been fascinated with ancient Egypt since she read a book about the discovery of Tut's tomb at the age of 11. As co-owner of Engels' Jewels of the Nile (an import business) since 1988, she makes annual trips to Egypt and Greece. Her vast collection of photos of archeological sites in Egypt includes many shots of "weird or unusual" subjects which caught her interest. Engel then attempts to research their origins and/or purpose by questioning Egyptologists or checking various reference books. She said many of her photos still remain a mystery!

Cats, both big and small, were solar in nature in the mythology of ancient Egypt. Big cats, such as lions and panthers, were most often associated with the powerful, scorching and often destructive aspects of the sun; while their smaller counterpart, the "domestic" cat, was usually associated with the sun's beneficial, life-giving aspects. Feline deities were frequently feminine, such as the lion deity, Sekhmet, and the cat deity, Bastet. However, several male deities have been identified who also have feline affiliations.

Sekhmet (who was most usually represented as a woman with a lion's head surmounted by a uraeus and solar disk) is probably the most widely-recognized of the feline-associated deities. As goddess of the Memphite triad, she was the consort of Ptah and mother of Nefertem. She was the defender of divine order and, in mythological tales, was frequently associated with her father, Ra. Known as "Mighty One," she was the personification of the scorching, destructive power of the sun - a fierce goddess of war and strife, and bringer of retribution to the enemies of Ra. Her weapons were the arrows with which she pierced men's hearts, and she was said to spread terror everywhere.



Sekhmet
at the British Museum

Even the henchmen of Seth and the serpent, Apophis, were said to fear her. Hot desert winds were regarded as her breath and, as the "Eye of Ra," she was associated with the fire-spitting uraeus upon the brow of pharaoh. Sekhmet had a softer side, however, and was also known for her great healing powers. As a healer, she was known as "Great of Magic" and it was her knowledge of sorcery that was appealed to when a medical problem required her intervention.

In one popular myth, Hathor takes the form of Sekhmet and nearly destroys the human race in her fury. Ra (who wants to preserve mankind) tricks Sekhmet into becoming drunk by substituting wine for the blood of her victims, thereby preventing man's annihilation. Afterwards, Sekhmet was honored by placing

her as the uraeus serpent on Ra's brow where she could protect his head and spit forth flames at his enemies. As a result of this myth, commemorative, orgiastic drinking festivals were held in Sekhmet's honor.



Bastet is a sister-form of Sekhmet. Although she was usually portrayed as a cat or a cat-headed woman, Bastet was sometimes also portrayed with the head of a lioness. In later dynastic times, Sekhmet and Bastet were regarded as the goddess of the west and the east, respectively. In this portrayal, both goddesses were depicted with lion's heads, with Sekhmet draped in a red garment and Bastet in a green garment.

Bastet was originally a local deity of the eastern Delta. She appears in Egyptian records as early as the Second Dynasty and was primarily worshipped at her temple at Bubastis, capital of the seventh nome of Lower Egypt. In her form as a woman with a cat's head, she frequently held a sistrum in her right hand and an aegis (a collar-like necklace associated with protection) in her left.

According to early legend, Bastet was the soul of Isis, and it was in this form that she was worshipped at Bubastis. Her chief festivals at Bubastis were celebrated in the months of April and May.

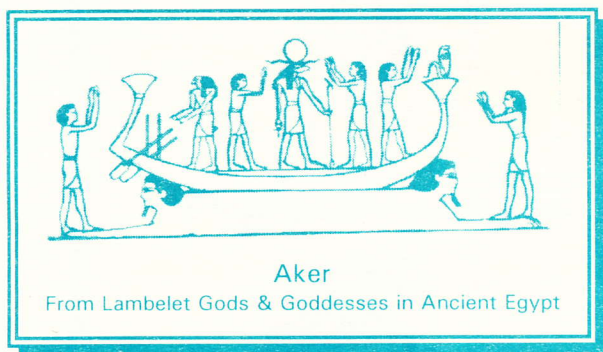
According to Herodotus, during the feast of Bubastis the populace sailed towards the city while making a great deal of noise, some playing music on drums, tabers and pipes, while others clapped along, danced, and openly cast off their clothing. From this description, Bastet's association with joy, music and dancing is apparent. An inscription of Ramses IV forbids hunting lions during the festival of Bastet. During the 22nd Dynasty, pharaohs (who were of Libyan origin) made their capital near Bubastis and adopted Bastet as their own goddess. At that time, the temples at Bubastis were enriched and a great new shrine to Bastet was built at Thebes.



Tefnut (who is also depicted as having a woman's body and a lion's head) had an important place in Heliopolitan cosmogony, where she was the daughter of Atum ("he who created himself"). Atum's first act after his self-creation was to bring forth the twins, Shu and Tefnut. This he did by means of masturbation. Atum was said to have spit out Shu and vomited forth Tefnut. Priests at

Heliopolis considered Shu to be the life principle, and Tefnut to be the principal of world order (*ma'at*). *Ma'at* later became a goddess in her own right.

Tefnut was also thought to be the personification of life-giving dew and moisture, and it was said that the tears she shed while helping her consort Shu support the sky became incense-bearing plants. Tefnut and Shu were said to receive the newborn sun as it broke from the eastern mountains each morning, demonstrating a strong solar connection. In one myth, Tefnut escapes into the desert of Nubia and Ra sends Shu and Thoth to fetch her back. Thoth and Shu change themselves into baboons and track Tefnut to the Mountain of Sunrise (the birthplace of Osiris) where Thoth uses his magic to overcome her and bring her back. In Leontopolis, Shu and Tefnut were worshipped as the double-lion god, Ruty, whose name stems from "ru," the hieroglyph of a recumbent lion.



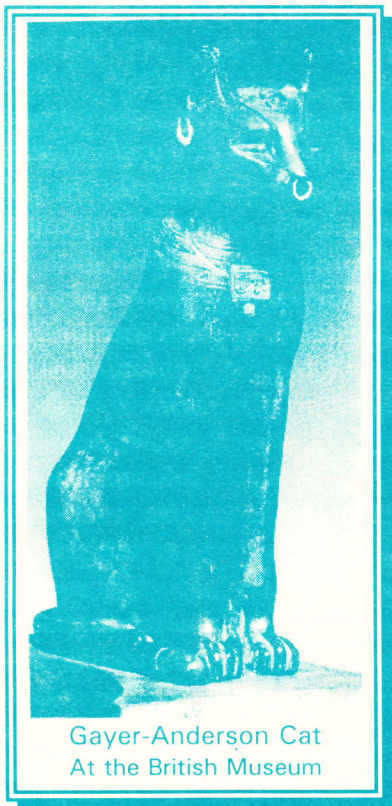
Aker was the embodiment of the earth who guarded the junction of the western and eastern horizons of the underworld. He was represented as either two human heads or the foreparts of two lions juxtaposed so that they faced away from one another, with one facing east towards the rising sun and one facing west towards the setting sun. Aker was charged with opening the earth's gate in order for the deceased king to pass into the underworld, and he is often shown bearing the barque of the sun across his back in its nightly journey through the underworld.

Aker was said to absorb poison from the body of anyone bitten by a snake and to neutralize venom in the belly of a person who has swallowed an obnoxious fly. One of his most important duties was to imprison the coils of the Apophis serpent after it was hacked to pieces. This idea of enclosure accounted for his being identified with the socket which held the mast of the underworld barque. The "Book of Aker" concerned the solar journey between the hours of sunset and sunrise. Aker's threatening side became evident when he pluralized into the Akeru or earth gods. These primeval deities are even more ancient than Geb, a representation of the earth.

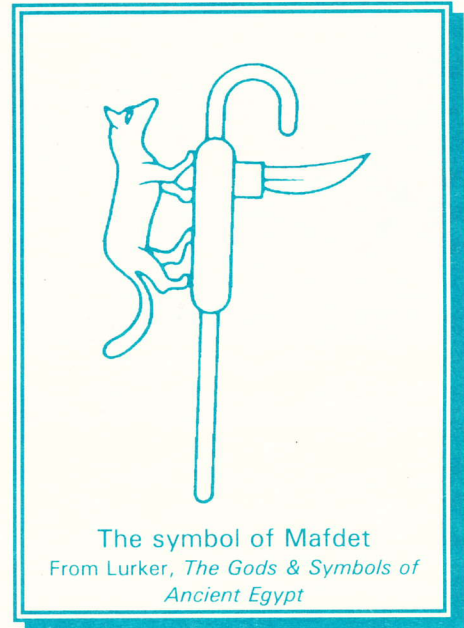
Mihos (or Miysis) was the son of Bastet and Ra (in Lower Egypt). He is usually depicted as a man with a lion's head wearing the *atef* crown or, in later periods, with a solar disk. In his personification as "Lord of Slaughter," he is shown as a lion devouring a captive. His local roots were at Leontopolis in the eastern Delta, near the modern site of Tel el Muqdam. Pharaoh Osorkon III (22nd Dynasty) erected a temple to Mihos at Bubastis, and his name appears in late New Kingdom amuletic papyri. During Hellenistic times, his epithet was "Light, Fire, Flame." At Dendera, he was called "Lord of Aphroditopolis" and he is supposedly the offspring of Bastet and Osiris.

Although **Nefertem** is most frequently associated with the divine blue lotus out of which the sun rises, and was usually depicted as a man holding a lotus scepter wearing a headdress of plumes, Nefertem also had a close affiliation with the lion. He was often portrayed standing upon a lion, and was sometimes depicted, in a composite of the identifying characteristics of his mother Sekhmet and father Ptah, with the head of a lion and an anthropomorphic body. Nefertem was referred to as the "lotus bloom which is at the nose of Ra," and his primary function was as the god of fragrance. At Buto, Nefertem was said to be the original son of Wadjet, the cobra goddess, who could also take lion form.

Shezmu was the blood-thirsty god of wine and unguent oil presses. Like Sekhmet, he had a dual nature: sometimes cruel, sometimes beneficent. Originally portrayed as lion-headed with an anthropomorphic body, he was depicted as a lion in later dynasties. Shezmu's worship dates back to the Old Kingdom and it is evident from a bowl found near the Step Pyramid at Sakkara that he already had an established priesthood at that time. In Old Kingdom Pyramid Texts, Shezmu was said to bring grape juice to the king for wine production. In a spell found in Old Kingdom pyramids in which the king absorbs extra divine strength by eating certain deities and powerful beings, Shezmu is the butcher who cuts them up and cooks them for pharaoh on the evening hearthstone. Shezmu had a cult following in the Faiyum during the Middle Kingdom. During the New Kingdom, focus changed to emphasize his more beneficial aspect as the processor of fragrances and perfumes, and he was described as the "god manufacturer of the prized-quality oil of Ra." In the storage rooms for unguents at Dendera and Edfu, his title is shown as "Master of Perfumery."



Gayer-Anderson Cat
At the British Museum



The symbol of Mafdet
From Lurker, *The Gods & Symbols of Ancient Egypt*

The panther goddess **Mafdet** was venerated from earliest times as the manifestation of judicial authority. Her ferocity was said to prevail over snakes and scorpions, and the scratch of her claws was considered to be lethal to snakes. Symbolically, the barbs of the king's harpoon became Mafdet's claws for decapitating his enemies in the underworld. Mafdet was described as leaping at the heads of snakes in mongoose-like fashion. In her honor, the device used for executions was called the "*mafdet*." This device consisted of a pole, curved at the top, with a coil of rope around the shaft and a projecting blade. In her form as feline predator, Mafdet was pictured running up the pole.

Pakhet was a lioness goddess who was worshipped at the entrance of a wadi in the eastern desert near Beni Hasan. Her name "She Who Snatches" or "The Tearer" is evocative of her nature. In Coffin Texts, she was referred to as "Pakhet the Great" and is described as a night huntress with sharp claws. Early Greek settlers likened her to Artemis, goddess of the chase; and Speos Artemidos, the Cave of Artemis, became the common designation of her rock chapel near Beni Hasan, which was carved out of limestone during the 18th Dynasty under the reign of Hatshepsut.



The Great Cat
From Malek, *The Cat in Ancient Egypt*

The **Great Cat** protected the rising sun from the serpent, Apophis, in the *Book of the Dead*. Images of the Great Cat are often found in tomb scenes where he is shown cutting off the head of the Apophis serpent while it is wrapped around a tree. The Great Cat does not appear to be a domestic cat, but rather the short-tailed jungle cat which is known to have lived in the thickets of the Delta and whose hostility to snakes caused it to become sacred to the sun god.

The lioness consort **Mekhit** is probably a manifestation of Sekhmet. She was the consort of Onuris, a warrior and hunter god, originally from Abydos.



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Onuris was said to have brought Mekhit back after a journey to the south. Her personification as the vengeful eye of the sun god, Ra, is obviously in the tradition of the other feline daughters of Ra. In funerary papyrus the lioness goddess Shesmetet was said to have given birth to the king and, in a spell to be recited on the last day of the year, the name Shesmetet was invoked as a magical force against demons of slaughter. Her epithet, "Lady of Punt," seems to indicate that she may have had exotic origins from that incense-plant region.

Apedemak was a lion god of war indigenous to the Sudanese culture of Meroe. Meroe's culture displayed many Egyptian influences and incorporated many of the deities of ancient Egypt. Apedemak was represented as an anthropomorphic god with a lion's head who held a scepter surmounted by a seated lion. Like Sekhmet, he appears to have been associated with battles. His main sanctuary was at Musawwarat es-Sufra, just north of the sixth cataract of the Nile.

BIBLIOGRAPHY

- Budge, E.A. Wallis. *The Gods of Ancient Egypt*. Dover Publications, Inc., New York.
- Hart, George. *Dictionary of Egyptian Gods and Goddesses*. Rothledge, Chapman and Hall, Inc.
- Ions, Veronica. *Egyptian Mythology*. Hamlyn Publishing Group Ltd.
- Lurker, Manfred. *The Gods and Symbols of Ancient Egypt*. Thames and Hudson.
- Wilkinson, Richard H. *Reading Egyptian Art*. Thames and Hudson, New York.

