LOST ANCIENT TECHNOLOGY

BRIEN FOERSTER

OF

.

Lost Ancient Technology Of Egypt Copyright Brien Foerster 2014 Cover copyright Bryan Foerster 2014 Dedication

I dedicate this book to those that ignited my interest in ancient Egypt, and those that fuelled that interest into a passion that grows each day. First of all to my mother Ann, who read me bedtime stories of the lives of the pharaohs, classical Greece and Rome, and global mythology. To my dear wife Irene, who has accompanied me to the magical land, and supported me when I had to go alone. To those great scholars, Graham Hancock, Robert Bauval, John Anthony West, Christopher Dunn and Robert Schoch whose insights into ancient Egypt stirred up controversy and in some cases vehement attacks from conventional scholars.

I wish also to thank all of the Egyptologists whose work has revealed so much that we now know about the dynastic Egyptians; who they were, when they lived, and what they accomplished. But my deepest love and respect goes to Stephen Mehler, Yousef, Patricia and the rest of the Awyan family, who live across the street from the Giza Plateau. Their warmth of spirit, dedication to the true knowledge of the ancient land, and always open door has made each and every one of them a member of my family.

And finally, this book is especially dedicated to Abd'El Hakim Awyan, archaeologist, Egyptologist, traditional wisdom keeper and patriarch of the Awyan family. I often feel his presence when we are in the ancient sites, and sense him smiling as we all work together to unravel these mysteries of his beloved Khemit. He, along with Stephen Mehler created the study now known as Khemitology, which introduces into the pool of knowledge many aspects and interpretations which conventional Egyptology does not, or cannot address.

Hakim's knowledge and wisdom came from degrees in archaeology and Egyptology, but what made his approach to the history of Egypt unique is that he spent most of his life as a tour guide, and from childhood learned from his observations in the field, as well as consulting with those who were the caretakers of the sacred sites. This oral tradition has seemingly been ignored by most Egyptologists, and few are those, such as Hakim, who have been capable of acquiring a fuller history of this ancient land.

Forward

I was quite pleased when Brien Foerster asked me to write the forward for this book—pleased not only because Brien has become a respected colleague and good friend, but mainly because I consider him to be one of the clearest and best researchers of ancient cultures and civilizations in the world today.

My own interests and pursuits in the field of human prehistory and ancient history now approaches 50 years of research. My main area of interest has been the civilization known as ancient Egypt—an enduring interest since the age of eight—and became my main professional area since 1968. I must mention two profound teachers who have supremely guided me in this direction: the first being Professor Francois Bordes, former Director of Antiquities for SW France, one of the great prehistorians of the 20th Century. Prof. Bordes, whose doctorate was in geology, taught me not only basic field archaeology in the summer of 1974, but the fundamentals of geology—which I now consider essential for any archaeologist. But my greatest teacher appeared only when I was ready—and only after years of research on my own in academic Egyptology.

I became involved in the research of ancient crystal skulls in the 1980s, was featured in a book on the subject and was then on a panel at the San Francisco Whole Life Expo in 1987. There I met two people manning a booth for a travel agency—they were Dr. Ruth and Harry Hover, agents for Power Places Tours who led spiritual trips to Egypt. I became great friends with Ruth and Harry, and they told me they used a "special" tour guide in Egypt named Abd'El Hakim who knew the "old ways" and had profound knowledge of very ancient Egypt. I knew--then and there--that I had to meet this man.

It wasn't until over five years later-when I was ready-in November of 1992—that a series of events unfolded that enabled me to go on tour with Power Places and join a group led by Nicki Scully who had come to Egypt with the Grateful Dead in 1978 and had met Hakim and used him as guide. I discuss the amazing meeting with Hakim—guided by the Sphinx —in my first book. For the next 16 years—until his "westing" in August 2008 (almost six years to the day as I type this)—I became Hakim's most devoted student and disciple. His teachings were truly unique, which were a result of his extraordinary background. Hakim held dual academic degrees in archaeology and Egyptology from Fouad (now Cairo) University in the early 1950s—but it was his enduring thirst for true ancient knowledge that led him to be sent by a beloved uncle as a small boy to study with Sufi masters. Hakim was an active tour guide for 56 years, having been a member of the first class of licensed guides in 1952. He had 76 years of active fieldwork, having started his career removing rubble and rocks for American Egyptologist, George Riesner, on the Giza Plateau at the tender age of six. Hakim spent his early years travelling all over Egypt to seek out and learn from the wisdom keepers who kept the great oral traditions that predated Egyptology and that have been passed down for thousands of years before there were written records. Hakim was a true Master of the Oral Tradition, and at every site he would take me to over the years, he always introduced me to the "Keepers"-old men in traditional dress who kept the "secrets."

Hakim presented to us the tradition that there had been a prehistoric, predynastic Egypt that had existed many thousands of years before the time Egyptology had labeled "ancient Egypt"—a civilization of advanced knowledge and technology that had carved the Sphinx and built the stone masonry pyramids—which were not "tombs" but machines! Hakim taught the civilization was called Khem—later known as Khemit, the "Black Land," and had existed in full glory over 10,000 years ago. Hakim had the system—I just put the label on it! Together we created the discipline of Khemitology, as opposed to Egyptology—which Hakim labeled "Greco-Roman Mythology." With his guidance, I wrote two books, *The Land of Osiris* (Adventures Unlimited Press, 2001) and *From Light into Darkness: The Evolution of Religion In Ancient Egypt* (Adventures Unlimited Press, 2005). *Land* later came out in Russian, Croatian, Italian and Czech something both Hakim and I were proud of.

In the late 1990s Hakim and I spoke of creating a school that would continue the work and further the teachings. This dream has now become a reality; as Hakim's son Yousef and his wife, Patricia Lehman Awyan, formed the Khemit School of Ancient Mysticism in 2009. Patricia first came on tour with me in 2005 and met Hakim and fell in love with Egypt —and Khemit. She returned in 2007, to take part in Hakim's last full tour. She returned again in 2008 and met and married Yousef. Patricia has a deep connection to the teachings and was fully embraced by Hakim and the Awyan family—as I was! I have known Yousef Abdel Hakim Awyan since he was eleven years old. He is his Father's son and so much more. The Khemit School, www.khemitology.com, has been leading tours in Egypt since 2010.

It was Hakim who is the connection between Brien Foerster and me. Neither of us remembers exactly when but it was through social media, Face book that Brien and I connected. Brien saw the video series, *The Pyramid Code*, produced by Carmen Boulter. The series featured some excellent interview clips of Hakim introducing some of the concepts of Khemitology. I had introduced Carmen to Hakim at the Cairo Airport in 1997. The series was produced in 2009. Brien relates how he was instantly drawn to Hakim, his voice, his energy, his knowledge and his wisdom. Brien soon found me on Face book—and the rest is history.

This book is the result of two trips Brien Foerster has taken to Egypt-on tour with the Khemit School in April 2013 and 2014. We called these tours "Techno-Spiritual"—as the ancient Khemitians did not differentiate between the two—and the tour in 2013 featured my dear friend and esteemed colleague, Christopher Dunn. Brien came to Egypt with not only his mind and eyes open, but with an open heart, too. Because of this, not only ancient Khemit but modern Egypt and her people opened to him. Because of the great connections of Yousef Awyan, who carries the mantle of his father, and Mohamed Ibrahim, our Tour Director and Egyptologist; Brien was able to see and experience many things "normal" researchers and tourists-even Egyptologists-have never seen! I have said Brien's first two trips were like the first five for me—we found so many new things. This book contains his wonderful insights gained through his vast knowledge of ancient South American, Polynesian and Micronesian, and many Native cultures. The photos contained in this book are fresh and current, and the understanding Brien demonstrates throughout the text is uniquely profound. "Lay people" and professionals alike will enjoy and gain from Brien Foerster's deep insights and powers of observation. I look forward to many more hours in the field with Brien-in my beloved Egypt and his beloved Peru.

Stephen S. Mehler, M.A.



The author with Stephen Mehler at JFK airport on the way to Cairo in 2013

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<u>1/ Introduction</u>

Egypt, or more specifically ancient Egypt is a subject that has fascinated people from around the world since Napoleon Bonaparte, for example, arranged the first studies in Egyptology when he brought some 150 scientists and artists to study and document Egypt's natural history, which was published in the *Description de l'Égypte*. (1) That was a series of publications, appearing first in 1809 and continuing until the final volume appeared in 1829, which offered a comprehensive scientific description of ancient and modern Egypt as well as its natural history.

It was the collaborative work of about 160 civilian scholars and scientists, known popularly as the savants, who accompanied Napoleon's expedition to Egypt in 1798 to 1801 as part of the French Revolutionary Wars, as well as about 2000 artists and technicians, including 400 engravers, who would later compile it into a full work.



Engraving made from Napoleon's visit

The history of Egypt has been tumultuous; to say the least in the at least 5000 years since the rise of the first leaders, the so called pharaohs. Rather than there being a smooth succession of rulers from the first until the last, major periods of internal rivalry and foreign invasion left scars on the land. Historical records were deliberately or accidentally destroyed, such as the burning of the library of Alexandria, and many of the great temples and pyramids were damaged or destroyed by people later than their builders. In many cases the reason for the damage was to erase the existence of an earlier ruler and his accomplishments, or to build new structures from a site that was no longer considered relevant.

The Royal Library of Alexandria, or Ancient Library of Alexandria, in Alexandria, Egypt, was one of the largest and most significant libraries of the ancient world. It was dedicated to the Muses, the nine goddesses of the arts. (2) It flourished under the patronage of the Ptolemaic dynasty and functioned as a major center of scholarship from its construction in the 3rd century BC until the Roman conquest of Egypt in 30 BC. With collections of works, lecture halls, meeting rooms, and gardens, the library was part of a larger research institution called the Museum of Alexandria, where many of the most famous thinkers of the ancient world studied.



Drawing of what the library of Alexandria may have looked like

The library was created by Ptolemy I Soter, who was a Macedonian general and the successor of Alexander the Great. (3) As a symbol of the wealth and power of Egypt, it employed many scribes to steal books from around the known world, copy them, and never returned them. Most of the books were kept as papyrus scrolls, and though it is unknown how many such scrolls were housed at any given time, their combined value was incalculable. The library is famous for having been burned resulting in the loss of many scrolls and books, and has become a symbol of the destruction of cultural knowledge. A few sources differ on who is responsible for the destruction and when it occurred. Although there is a mythology of the burning of the Library at Alexandria, it may have suffered several fires or acts of destruction over many years.

Possible occasions for the partial or complete destruction of the Library of Alexandria include a fire set by Julius Caesar in 48 BC, an attack by Aurelian in the 270s AD, the decree of Coptic Pope Theophilus in 391 AD, and the decree of the second caliph Omar ibn Al-khattāb in 640 AD. After the main library was fully destroyed, ancient scholars used a "daughter library" in a temple known as the Serapeum, located in another part of the city. According to Socrates of Constantinople, Coptic Pope Theophilus destroyed the Serapeum in 391 AD.

As the library was first built, and its collections gathered under the rule of the Ptolemaic dynasty, as in the Greeks, one has to wonder if it was in fact a complete record of all of Egyptian history. The Ptolemies were quite unlike other foreigners who had ruled Egypt in several respects. Most importantly, they ruled within Egypt. One of the best phrases for understanding the nature of their government's relationship with the country on which they imposed their rule is that "the Ptolemies used Egypt." By contrast, it is fair to say that "the Romans abused Egypt." The Greeks could use Egypt because they came upon a well-developed country in respect to its economic, intellectual, and political life. These factors were in force to an extent which was unparalleled anywhere else within the Hellenistic world where the Greeks had placed themselves to rule over indigenous populations. In the case of Egypt, the Ptolemies found themselves in control of a highly sophisticated ancient civilization and administration, not a group of cloddish barbarians. The Egyptians had as high a level of culture as the Greeks, but it was quite different from theirs. (4)

The idea that the Greeks were of as high a cultural level is a dubious point when you take into account how long each civilization had existed prior to their engagement. In the 8th century BC, Greece began to emerge from the Dark Ages which followed the fall of the Mycenaean civilization. Literacy had been lost and Mycenaean script forgotten, but the Greeks adopted the Phoenician alphabet, modifying it to create the Greek alphabet. From about the 9th century BC written records began to appear. (5) Greece was divided into many small self-governing communities, a pattern largely dictated by Greek geography: every island, valley and plain is cut off from its neighbours by the sea or mountain ranges.

A mercantile class arose in the first half of the 7th century, shown by the introduction of coinage in about 680 BC. This seems to have introduced tension to many city states. The aristocratic regimes which generally governed were threatened by the new-found wealth of merchants, who in turn desired political power. Athens suffered a land and agrarian crisis in the late 7th century, again resulting in civil strife. The Archon (chief magistrate) Draco made severe reforms to the law code in 621 BC (hence "draconian"), but these failed to quell the conflict. Eventually the moderate reforms of Solon (594 BC), improving the lot of the poor but firmly entrenching the aristocracy in power, gave Athens some stability.



Battles occurring in classical Greek times

Two major wars shaped the Classical Greek world. The Persian Wars (500 to 448 BC) are recounted in Herodotus's *Histories*. Ionian Greek cities revolted from the Persian Empire and were supported by some of the mainland cities, eventually led by Athens. The wars had left devastation in their wake. Discontent with the Spartan hegemony that followed induced the Thebans to attack. Their general, Epaminondas, crushed Sparta at the Battle of Leuctra in 371 BC, inaugurating a period of Theban dominance in Greece. In 346 BC, unable to prevail in its ten-year war with Phocis, Thebes called upon Philip II of Macedon for aid. Macedon quickly forced the city states into being united by the League of

Corinth which led to the conquering of the Persian Empire and the Hellenistic Age had begun. Soon Alexander the Great conquered Egypt at an early stage of his great journey of conquests, which lasted from 332 to 323 BC. He respected the pharaohnic religions and customs and he was declared by the priest, pharaoh of Egypt. However, according to Stephen Mehler it was more that he was appointed *High Priest of Amen*, and not pharaoh, which Stephen and the Khemit School believe to have been the title of the female, not male in the society back into deep antiquity. *Pharaoh* seems to be the Greek form of the earlier term *Per-Aah*, meaning *high house* in Khemitian.

Compare this now with the history of Egypt, which has always been centered near the life giving Nile River, center of somewhat stable agricultural production for thousands of years. A unified kingdom was founded according to most Egyptologists around 3150 BC by King Menes, leading to a series of dynasties that ruled Egypt for the next three millennia. Egyptian culture flourished during this long period and remained distinctively Egyptian in its religion, arts, language and customs. The first two ruling dynasties of a unified Egypt set the stage for the Old Kingdom period, 2700 to 2200 BC., which constructed many pyramids; most notably the Third Dynasty pyramid of Djoser at Saqqara and some believe the Fourth Dynasty Giza Pyramids.

The First Intermediate Period ushered in a time of political upheaval for about 150 years. (6) Stronger Nile floods and stabilization of government, however, brought back renewed prosperity for the country in the Middle Kingdom *c*. 2040 BC, reaching a peak during the reign of Pharaoh Amenemhat III. A second period of disunity heralded the arrival of the first foreign ruling dynasty in Egypt, that of the Semitic Hyksos. The Hyksos invaders took over much of Lower Egypt around 1650 BC and founded a new capital at Avaris. They were driven out by an Upper Egyptian force led by Ahmose I, who founded the Eighteenth Dynasty and relocated the capital from Memphis to Thebes. The New Kingdom, 1550 to 1070 BC, began with the Eighteenth Dynasty, marking the rise of Egypt as an international power that expanded during its greatest extension to an empire as far south as Tombos in Nubia, and included parts of the Levant in the east. This period is noted for some of the most well-known Pharaohs, including Hatshepsut, Thutmose III, Akhenaten and his wife Nefertiti, Tutankhamun and Ramesses II. The first historically attested expression of monotheism came during this period as Atenism, led by Akhenaten and Nefertiti until the Amun (or Amen) priesthood, who had previously been in power, took over once again. Frequent contacts with other nations brought new ideas to the New Kingdom. The country was later invaded and conquered by Libyans, Nubians and Assyrians, but native Egyptians eventually drove them out and regained control of their country. (7) The Thirtieth Dynasty was the last native ruling dynasty during the Pharaohnic epoch. It fell to the Persians in 343 BC after the last native Pharaoh, King Nectanebo II, was defeated in battle. Soon after, Alexander the Great entered the land.



Relief carving of Akhenaten's family

For it to be suggested that the Greeks had as high a level of culture, and with that scientific and artistic achievement, taking into account their incredibly war like tendencies which seemingly resulted in long periods of social instability as that of the Egyptians is most likely naïve. Though Egypt had its fair share of disputes, both internal and external, it was relatively stable for 3000 years. This could have led to prolonged cultural evolution, or at least retention of what was known of science and art up until the Greek, and worst yet Roman occupations.

Egyptology is the study of ancient Egyptian history, language, literature, religion, architecture and art from the 5th millennium BC until the end of its native religious practices in the 4th century AD. A practitioner of the discipline is called an "Egyptologist". In Europe, particularly continental Europe, Egyptology is primarily regarded as being a philological discipline (the study of language in written historical sources,) while in North America it is often regarded as a branch of archaeology.

Some of the first historical accounts of Egypt were given to us by Herodotus, Strabo, Diodorus Siculus and the largely lost work of Manetho, who was an Egyptian priest during the reign of Ptolemy I and Ptolemy II in the 3rd century BC. The Ptolemies were very much interested in the work of the ancient Egyptians, and many of the monuments, including the pyramids, were restored by them (although they built many new temples in the Egyptian style.) The Romans too carried out restoration work in this most ancient of lands.

Abdul Latif al-Baghdadi, a teacher at Cairo's Al-Azhar University in the 13th century, wrote detailed descriptions on ancient Egyptian monuments. (8) Similarly, the 15th-century Egyptian historian al-Maqrizi wrote detailed accounts of Egyptian antiquities. European exploration and travel writings of ancient Egypt commenced from the 13th century onward, with only occasional detours into a more scientific approach, notably by Claude Sicard, Benoît de Maillet, Frederic Louis Norden and Richard Pococke. In the early 17th century, John Greaves measured the pyramids, having inspected the broken Obelisk of Domitian in Rome, and then destined for the Earl of Arundel's collection in London. (9) He went on to publish the illustrated Pyramidographia in 1646, while the Jesuit scientistpriest Athanasius Kircher was perhaps the first to hint at the phonetic importance of Egyptian hieroglyphs, demonstrating Coptic as a vestige of early Egyptian, for which he is considered a "founder" of Egyptology. In the late 18th century, with Napoleon's scholars' recording of Egyptian flora, fauna and history, published as Description de l'Egypte the study of many aspects of ancient Egypt became more scientifically oriented. And when the British captured Egypt from the French and gained the Rosetta

stone. Modern Egyptology is generally perceived as beginning about 1822.



The Rosetta stone in the British Museum in London

The Rosetta stone is a granodiorite stele inscribed with a decree issued at Memphis in 196 BCE on behalf of King Ptolemy V. The decree appears in three scripts: the upper text is ancient Egyptian hieroglyphs, the middle portion Demotic script (the stage of the Egyptian language following Late Egyptian and preceding Coptic,) and the lowest Ancient Greek. Because it presents essentially the same text in all three scripts (with some minor differences among them), it provided the key to the modern understanding of Egyptian hieroglyphs.

Study of the decree was already under way as the first full translation of

the Greek text appeared in 1803. It was 20 years, however, before the transliteration of the Egyptian scripts was announced by Jean-François Champollion in Paris in 1822; it took longer still before scholars were able to read Ancient Egyptian inscriptions and literature confidently. Major advances in the decoding were recognition that the stone offered three versions of the same text (1799); that the demotic text used phonetic characters to spell foreign names (1802); that the hieroglyphic text did so as well, and had pervasive similarities to the demotic (Thomas Young, 1814); and that, in addition to being used for foreign names, phonetic characters were also used to spell native Egyptian words (Champollion, 1822 to 1824).

Though the Rosetta stone has clearly proven useful, questions arise from some Egyptian hieroglyphic experts as to its accuracy, especially the validity and depth of meaning of the ancient Egyptian glyphs. Since the Rosetta stone was the work of scribes during the time of Greek occupation, the ancient Egyptian meanings could simply be the superficial aspects, rather than the deeper expressions of the priestly class, for example. Author Laird Scranton, in his first book, *The Science of the Dogon*, demonstrated that the cosmological structure described in the myths and drawings of the Dogon (an ethnic group living in the central plateau region of the country of Mali, in Western Africa) runs parallel to modern science (atomic theory, quantum theory, and string theory), with Dogon drawings often taking the same form as accurate scientific diagrams that relate to the formation of matter.

Scranton also pointed to the close resemblance between the keywords and component elements of Dogon cosmology and those of ancient Egypt as well as to the implication that ancient cosmology may also be about actual science. *Sacred Symbols of the Dogon* uses these parallels as the starting point for a new interpretation of the Egyptian hieroglyphic language. By substituting Dogon cosmological drawings for equivalent glyph shapes in Egyptian words, a new way of reading and interpreting the Egyptian

hieroglyphs emerges. Scranton shows how each hieroglyph constitutes an entire concept and that their meanings are scientific in nature. Using the Dogon symbols as a "Rosetta stone," he reveals references within the ancient Egyptian language that define the full range of scientific components of matter.

Abd'El Hakim Awyan did not feel that Champollion's translations were of any depth, since the Greeks themselves were not privy to the depths of the meanings of the symbols (from personal consultations with Stephen Mehler.)



Dogon village in a recent photo

Therefore, the exclusive use of the Rosetta stone as a way to translate

Egyptian hieroglyphics and therefore interpret what they are saying may be a superficial exercise, with the deeper meanings being lost. What this means is that Egyptology may just be brushing the surface of the history of ancient Egypt, and this comes into play here especially when we look at some, and I must stress some of the ancient structures of Egypt and what they were originally made for, and by whom.

Egyptology's modern history begins with the invasion of Egypt by Napoleon Bonaparte. The subsequent publication of Description de l'Egypte between 1809 and 1829 made numerous ancient Egyptian source materials available to Europeans for the first time. Jean François Champollion, Thomas Young and Ippolito Rosellini were some of the first Egyptologists of wide acclaim. The German Karl Richard Lepsius was an early participant in the investigations of Egypt; mapping, excavating, and recording several sites. Champollion announced his general decipherment of the system of Egyptian hieroglyphics for the first time, employing the Rosetta stone as his primary aid. With subsequently ever increasing knowledge of Egyptian writing and language, the study of ancient Egyptian civilization was able to proceed with greater academic rigour and with all the added impetus that comprehension of the written sources was able to engender. Egyptology became more professional via work of William Matthew Flinders Petrie, among others. Petrie introduced techniques of field preservation, recording, and excavating. Howard Carter's expedition and discovery of Tutankhamun brought much acclaim to the field of Egyptology. Many highly educated amateurs now also travelled to Egypt, however, including women such as Harriet Martineau and Florence Nightingale, who both left fascinatingly philosophical accounts of their travels, which revealed learned familiarity with all the latest European Egyptology.



William Flinders Petrie as a young man in Egypt

It must be stressed that we owe a tremendous debt of gratitude to all of the Egyptologists for they have provided us with invaluable information about the lives and achievements of the dynastic Egyptians from 3100 BC onwards. What this book will address are those constructions for which Egyptology, in my estimation does not have satisfactory answers as to who made them, when and why. The approach to this will be similar to my Legacy; Vintage Photos Of Ancient Egypt. We will explore from the most southern part of Egypt, so called Upper Egypt and move northwards, into what was known as Lower Egypt, discussing some of the puzzling works that are not properly explained along the way.

2/ Aswan Quarry

Aswan is the ancient city of Swenet, which in antiquity was the frontier town of ancient Egypt facing the south. Swenet is supposed to have derived its name from an Egyptian goddess with the same name. This goddess later was identified as Eileithyia by the Greeks and Lucina by the Romans during their occupation of ancient Egypt because of the similar association of their goddesses with childbirth, and of which means "the opener". The ancient name of the city also is said to be derived from the Egyptian symbol for trade, (10) and the Khemit School contend that it meant "The Beginning of the Waters" in ancient Khemitian, named after a much older city in the south where the Nile entered the land of Khemit, *The Black Land*.

Because the ancient Egyptians oriented toward the origin of the life giving waters of the Nile in the south, Swenet was the first town in the country, and Egypt always was conceived to "open" or begin at Swenet. The city stood upon a peninsula on the right (east) bank of the Nile, immediately below (and north of) the first cataract of the flowing waters, which extend to it from Philae. Navigation to the delta was possible from this location without encountering a barrier. The stone quarries of ancient Egypt located here were celebrated for their stone, and especially for the granitic rock called Syenite, which is usually pink or red in appearance. They furnished the colossal statues, obelisks, and monolithic shrines that are found throughout Egypt, including the pyramids; and the traces of the quarrymen who wrought in these 3,000 years ago are still visible in the native rock.



Astonishing flat wall at the Aswan quarry

Today there are 2 unfinished obelisks, one large and another much smaller that still lie in the quarry, attached firmly to the bedrock. Archaeologists claim the pharaoh known as Hatshepsut sanctioned the construction of the bigger of the two. It is nearly one third larger than any ancient Egyptian obelisk ever erected. If finished it would have measured around 42 m (approximately 137 feet) and would have weighed nearly 1,200 tons. (11) Archeologists speculate that it was intended to complement the socalled Lateran Obelisk which was originally at Karnak and is now outside the Lateran Palace in Rome. The obelisk's creators began to carve it directly out of bedrock, but cracks appeared in the granite and the project was abandoned. Originally it was thought that the stone had an undetected flaw (see photo) and thus work stopped abruptly on it.



Trench at the unfinished obelisk showing crack

The greatest questions that arise are, what tools could have been used to shape this massive stone monument, and how were the Egyptians planning on raising it out of the pit in which it sits, taking into account its immense size. To the former, most Egyptologists believe that round and hand held stone dolerite pounders were the main tools being used. Dolerite is a volcanic rock. While similar to basalt, it contains crystals which can be seen with a hand lens. This indicates that it cooled a little more slowly than basalt. Typically it is found in volcanic plugs which channelled the basalt to the surface. Dolerite contains pyroxene which is a hard silicate mineral with a hardness of 5 to 6.5 on what is called the Mohs scale.



Conventional pockets made for insertion of wooden wedges

The Mohs scale of mineral hardness characterizes the scratch resistance of various minerals through the ability of a harder material to scratch a softer material. It was created in 1812 by the German geologist and mineralogist Friedrich Mohs and is one of several definitions of hardness in materials science. As the hardest known naturally occurring substance when the scale was designed, diamonds are at the top of the scale and have the maximum value of 10, while all other materials have a lesser value.



Dolorite pounders at the quarry at Aswan

In basic terms, any tool should have a greater hardness than the material being cut or shaped. The pink granite of which the unfinished obelisk is composed has a Mohs hardness that sits between the scale of 6 and 7, and thus is more or less the same hardness as dolerite, making the latter a poor material for shaping the former. Also, Aswan granite contains between 45 and 55% quartz crystal, which has a Mohs value of 7, thus making this granite especially difficult to work with Bronze, the other tool substance known to and used by the ancient Egyptians is much softer, being on average 3.5 on the Mohs scale. If dolerite pounders were used to shape the granite, the tools would basically wear out as fast as the material being worked on, and sounds like an unlikely candidate.

I myself tried to make an impression in a granite surface at the Aswan quarry using one of the many dolerite pounders that lay around the site.

After 15 repeated hard blows, not more than a few small flecks of granite were removed, and my hand hurt as a result. In order to make any real impression in the granite material, a lot of force would need to be used. The problems encountered at the unfinished obelisk is that there is very little room inside the trench to be able to create a hard blow, and such repeated efforts could also break the dolerite tool.



View of the unfinished obelisk at its base

So if stone tools were not those that were used to attempt to shape and eventually release the obelisk from its bedrock enclosure? One of the best resources for looking at alternatives is engineer and master machinist Christopher Dunn's book *Lost Technologies of Ancient Egypt: Advanced Engineering in the Temples of the Pharaohs.* As regards the unfinished obelisk at Aswan, he quotes from Nova producer Peter Tyson who tried his hand at quarrying with a dolerite pounder:

'Cupping a greenish-black dolerite ball in my hands, I brought it down with a crack onto a block of granite. Over and over, I bounced it on the same spot, till I thought I'd scrape the skin off my palms. After ten minutes, my wrists hurt from trying to guide the 12 pound rock in at an angle- the better to break the granite – and stabs of pain began shooting up my arms. Mark Lehner (a major proponent of the dolerite pounder theory) recalled that after once pounding for several hours, he could barely type on a computer. I did it for only 20 minutes, and all I had to show for it was a baby's palmful of granite dust. And the granite's surface looked no different than when I'd stated.'

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