THE STONE AT ABU RAWASH

How New Evidence of Ancient Machining is Changing Our View of the Past

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Champaign, Illinois
For my friend and colleague
Christopher Dunn
I extend a very special thank you to my wife Ronda and Jean Dunn for their deeds and prayers while Chris and I traveled in Egypt, to the wonderful community of Danville, Illinois for their kindness, and to Judd Peck for his friendship, determination, and support.
In the spring of 2004 I began work on my second book *Before The Pharaohs*, a digest of John Anthony West and Robert Schoch’s theory of a prehistoric origin for ancient Egypt’s Great Sphinx. Aside from telling the story of West and Schoch’s work, I also searched for any evidence in the historical record, academic and independent, that would suggest the existence of a culture sophisticated and ambitious enough to carve a two hundred foot long lion out of bedrock. What I found was a mystery.

The birth of dynastic Egypt was purely hypothetical and the culture capable of carving such a monstrosity was non-existent. But I also found tantalizing hints of a civilization that may have existed long before 3000 BCE. During the 19th and 20th centuries, more than one Egyptologist commented on how the Old Kingdom dynasties achievements were never surpassed. North Africa natives could never have been responsible for such monumental construction projects, was the thinking of early Egyptology. As a result, Egyptologists interpreted ancient burial evidence indicating that two distinct cultures existed as reason to believe a ‘dynastic race’ was responsible for organizing dynastic civilization. At first this dynastic race was believed to be European. Later, with some supporting architectural evidence it was believed to be Sumerian. Today, Egyptologists have formed a consensus that dynastic Egypt was a creation of native cattle herders who sought a steady supply of water in an increasingly arid land.

Speculatively, however, it seemed plausible that an advanced civilization existed at some remote time in history. There were too many anomalies and anachronistic artifacts that need to be explained, the most obvious one being the Great Pyramid with its unusual internal design. After a decade of reading numerous books and watching hours of documentaries I was no closer to understanding its construction or purpose than the average fifth grade elementary student. Pyramids were tombs and the Great Pyramid was the greatest tomb of all.

In the spring of 2004 I also met Christopher Dunn who introduced me to a theory and a type of evidence that turned my view of an advanced prehistoric civilization from speculation to fact. The precise skill and advanced level of construction with which the pyramids and temples in Egypt were built with could never have been accomplished using simple hand tools. Whoever its builders were they had to have used powered machine tools of some kind.

As a machinist and expert in manufacturing technology with over forty years experience, there is no one better qualified than Christopher Dunn to inspect and analyze ancient Egypt’s stone working techniques. His analysis of the Great Pyramid, which can be read in his book *The Giza Power Plant*, is as scientific as it is thorough. Dunn not only explains every passageway and chamber, he also explains some of the more unusual evidence, such as scorch marks on the ceiling of the Grand Gallery and why the shafts in the Queen’s chamber are closed by a block that is embedded with two protruding copper fittings.

In 2006, Dunn discovered evidence not obvious to the layman, but obvious to him. Evidence any other machinist would certainly recognize. As his advocate and collaborator he invited me along on his next evidence gathering trip to Egypt. So, for a month in the spring of 2007 we lived and photographed as much of Egypt as we could.

There is no replacement for visiting Egypt. No documentary or book has ever truly captured the essence of Egypt’s ancient temples or temple ruins. There is granite everywhere. Ashlars, columns, broken temple edifices, fields of rubble, and piles of rubble; they built public buildings out of solid granite.

Being the hardest rock known, granite is difficult to work with. So, how could a culture so long ago built a civilization out of it using simple hand tools? No civilization before or since has done so. Why
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should the ancient Egyptians? They shouldn’t have, couldn’t have. But there has never been irrefutable evidence to suggest otherwise. That was before Christopher Dunn discovered a very unusual and telling stone at Abu Rawash.

The Stone at Abu Rawash is part travelogue and part history intended to present ancient Egypt’s ruins as I have experienced them, and to explain them as best that can be explained. Much of this book’s content is based upon my collaboration with Christopher Dunn over the past few years.

Edward F. Malkowski
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Introduction

Paradigms change. It is a fact of society. Throughout history, regardless of established political power, when enough people reject an accepted view in favor of a new view, a paradigm has changed. And it will only be a matter of time before the new view supplants the old.

Society is composed of people from a wide assortment of professions and trades that together form public opinion. Although most noticeable during election campaigns where it serves as a source of information for those seeking office, public opinion exists for every conceivable issue within any given society. Such as it is in the United States, the need for knowledge about public opinion on various issues has kept Gallop busy for more than seventy years.

Paradigm changes are never easy. They almost always occur very slowly, and they are not final until the old guard of the orthodoxy retires or passes away leaving a new, younger generation in the lead role of opinion making. The media is always at the cusp of change in public opinion and though books and the cinema new ideas that were once lunatic or fringe or even taboo find an audience, and sometimes an audience that senses a correction in thinking is needed.

During the 1970’s you would have never seen television shows that embrace the paranormal. In 1972, ABC tried with a series called The Sixth Sense starring Gary Collins but it only lasted a single season. Today, with shows like Charmed, Medium, The Ghost Whisperer, Angel, Buffy the Vampire Slayer, or Supernatural, to name a few, this once atypical genre is now commonplace. Why? People accept the idea that there is more to life than the physical world and have opted for non-traditional ways of expressing and entertaining that view. They also seek knowledge about the subject, which is evident in the number of publications; say for example, about consciousness which is at the core of understanding the human condition. Amazon lists more than 250,000 titles for ‘consciousness.’

The same is true for history, particularly ancient Egyptian history. Even the new March 2008 film 10,000 BC portrays an Egyptian-type civilization as an advanced prehistoric society - pyramids and all.

Egypt’s temples and pyramids have always been a curiosity. For some people, because of their scale, they have also been at the heart of a quest to discover a lost prehistoric civilization. The logic being, it is beyond belief how people fresh of out the Stone Age could build with such precision and scale. Like the subject of consciousness, ancient Egypt has also tipped the scales of public interest. To the chagrin of the orthodoxy (and sometimes anger) more heterodox history books have been written in the past twenty years than the previous one hundred years. Why? People want answers to some of the most basic questions that we all wonder about. Where did mankind and civilization come from?

The orthodoxy assures us that the root of this lost prehistoric civilization, Atlantis, is a farce. Plato made it all up as a morality tale. Still, it is peculiar that the lost city of Atlantis has been discovered in nearly every corner of the world. One has to wonder. How can so many people be wrong?

They can’t because it is a matter of evidence interpretation. Although Atlantis may have been nothing more than a morality tale, stories and legends of an advanced prehistoric civilization existed in ancient times as much as they do now. So does the evidence. A single piece of evidence that is an anomaly or anachronistic is easy to explain away and ignore. Maybe even several are, but there comes a point when there are too many anomalies, too many anachronisms, and then a problem of explanation exists within the accepted paradigm. Eventually, a number of researchers from various disciplines begin to explain some of these history’s mysteries and then a new view of the past begins to take shape, in opposition, of course, to the orthodoxy.

It’s a history forgotten, but a ‘war of paradigms’ over ancient Egypt and Atlantis has been going on for more than a hundred and fifty years. For the heterodoxy, with the public school system safely in the hands of the orthodoxy (which means adults sympathetic to the status quo) it has been an uphill climb to be heard and there has never been enough evidence to sway public opinion. That is, until John Anthony West, inspired by the works of René Schwaller de Lubicz, proposed to Boston University
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geo-ologist Robert Schoch that the weathering on the Sphinx is from water; inferring, of course, that the Sphinx is much older than the orthodoxy claims. After studying the Sphinx using some of the latest scientific techniques Schoch confirmed what West had thought all along, a prehistoric Sphinx. Their efforts were summarized and made into a nationally televised documentary, The Mystery of the Sphinx. So successful was their argument and the documentary that West was awarded an Emmy for best research.

In the fifteen years since The Mystery of the Sphinx first aired new evidence has come to light, and existing evidence has been addressed in new ways, such as the vast amount of granite the ancient Egyptians used in their construction projects. The builders of ancient Egypt built a civilization in granite, not a trivial feat, which could not have been accomplished without a mechanical method of cutting stone. But since they did build numerous, large structures in granite, then there would have to be machine tool evidence somewhere. Elusive but not impossible for expert machinist Christopher Dunn to identify; he found a patio of machine tool evidence at Giza. He also found a block of granite that exhibits irrefutable evidence that powered equipment was used in cutting stone. This stone, Dunn's stone, is a new Rosetta Stone, although technical in nature as opposed to linguistic.

With new insights on the Great Pyramid’s subterranean chamber engineer John Cadman discovered that when operating there was a pulse in the pyramid, a mechanical rhythm as the pyramid forced water through its underground system of tunnels. In contrast to a tomb of assumptions put forth by the orthodoxy’s, Cadman proved through experimentation that Khufu’s unfinished burial chamber was never designed to be a burial chamber. Rather, an integral part of the original design and a functioning part of Dunn’s power plant.

Most recently, there is physics-trained inventor John Burke offering a sound and scientific reason why the pyramids were built and what their energy was used for. Although a single pyramid was needed to generate energy, a network of pyramids was necessary to distribute that energy throughout the lower portions of the Nile Valley.

An understanding of ancient Egypt’s symbolic nature has also revealed that their technology was also expressed in their art. From Tanis to Thebes numerous forty to sixty-foot tall statues of Ramses were erected, not in honor of a living god but in the celebration of Nature in the idealized Man. The interpretation of which is unmistakable. They carved a philosophy in stone in tribute to their own civil greatness as it relates to an esoteric understanding of Man and Cosmos. And for physicist Paul LaViolette, their skill in building and carving was also used to create a message at Denderah encrypted in an elegant ceiling zodiac.

Despite the insistence from the orthodox establishment that the pyramids were tombs, were built using the simplest of tools, and that nothing technically sophisticated existed prior to the third millennium BCE, the cumulative evidence points in a very different direction. Who built a civilization in granite and a prehistoric Sphinx out of bedrock? Why did the most famous Egyptologist of all deduce that the builders of ancient Egypt must have had a mechanical method of cutting stone?

With a patio of machine tool evidence, and a new Rosetta Stone there exists a case for Civilization X.
1 - A Civilization in Granite

Egypt, and particularly the Giza Plateau, may be the single most visited place in the world. It may also be the most documented place in the world. More books have been written and more documentaries have been filmed about Giza, and ancient Egypt, than any other place or ancient civilization. For good reason, there are no other manmade monuments more grandiose than the Pyramids and the Great Sphinx, and there is no temple more mysterious and majestic than Luxor’s Temple of Amun-Mut-Khonsu. So large are the Giza pyramids it wasn’t until the Eiffel Tower’s completion in 1889 that a building was erected taller than the Great Pyramid. Even so, the mass of the Great Pyramid still ranks as one of the most massive structures in existence. Little wonder that the Great Pyramid is the Seventh Wonder of the World still standing.

In the numerous books and documentaries about ancient Egypt what is seldom addressed in a meaningful way is the volume of granite still remaining on the plateau - even after thousands of years of scavenging. The Oxford History of Ancient Egypt barely mentions it except to state that “the pyramid of Menkaure shows extensive use of granite.” Although true, granite rubble can be found nearly everywhere on the Giza Plateau, particularly on the south side of the middle pyramid, and to the east and south of the Valley Temple.

Without knowing its significance, tourists capture on film Giza’s fields of granite rubble. But it’s not majestic, nor is it anything special to show your family and friends in a ‘my vacation’ presentation. In fact, it is close to being uninviting. To the average tourist the rubble scattered about the plateau might even be perceived as an eyesore compared to the majesty of the pyramids and Sphinx. However, among the rubble there are beautifully crafted pieces of ornate granite displaying the handiwork of its builders.

Two characteristics distinguish the builders of this civilization, both of which require great skill, from all other civilizations of the past. One has been well documented. They built on a colossal scale. Why the ancient Egyptian’s built on such a scale is a matter of conjecture, but for whatever reason, it is a good bet that they considered it necessary. The second characteristic is that they chose to finish their structures with granite. Although most of the granite casings, facings, and columns of ancient Egypt’s structures have been destroyed or scavenged, stored to the Cairo Museum, or reduced to rubble, it is the granite workmanship that still exists which speaks of a grand unified ancient civilization. For the inquisitive mind that wants not only to know why but how it is the granite that creates of problem of explanation.

Granite is the hardest rock there is. Cutting it into shapes and sizes to build a structure or carve a forty-foot statue is a feat, today, best left to modern technology and machines tooled in diamonds. Yet, whoever built the ancient civilization we see the remnants of in Egypt were clearly experts in granite quarrying, transporting, and finishing. There is no statistic as to how much granite was used in ancient Egypt, but at nearly every ancient site there is granite, and a lot of it. At some sites there are multi-ton granite artifacts, evidence of know-how to effectively and efficiently quarry, cut, shape, and assemble mass quantities of granite.

The Giza Pyramids

Despite an army of local salesmen hawking trinkets, souvenirs, or camel rides, while wandering across the Giza Plateau it’s difficult not to be awe-struck, fixated on the pyramids simply by their sheer size. Large blocks of limestone and granite that were once part of these giants, stone hills pepper the landscape as a testament to the sense of permanence the builders desired. Standing between the third and second pyramids, what the local people say comes to mind, “Man fears time but time fears the
There is no sensation or vista in the world like it. From a distance, people walking along the base of the second pyramid look like an army of ants marching in rhythm to the feast of the day. The pyramids dwarf everything manmade I have ever seen, except perhaps the Presidents of Mount Rushmore.

The scale of construction exceeds everything known to mankind except for the most recent of projects built with twentieth century construction technology. Each monumental pyramid on the plateau was built on the scale of Arizona’s Hoover Dam. It is as if some ancient civilization’s Department of the Interior decided to build not one dam but three all within a quarter mile of each other, and then coat two of them with granite.

Today, however, they have been stripped of their granite glory and stand as mountains of course limestone blocks. Seeing them as they were upon completion would be more spectacular than anyone could imagine. Two large mountain peaks of pink granite and a third peak of white limestone, all three dancing in the brilliant sun.

The Great Pyramid, the crowning glory of the plateau and the focus of speculation for many an author, has been picked clean of its limestone casing. Only a few casing stones remain, most of which are in sorry shape.

Why the builders of the Great Pyramid chose limestone as its siding is unknown. Limestone is softer than granite and easier to work with. So it is no surprise that the limestone casing of the Great Pyramid has been completely removed. However, the Pyramid builders did use granite in various parts of the Great Pyramid. In its interior both the Grand Gallery and the uppermost chamber (more commonly known as the King’s Chamber) were constructed out of smooth, solid granite slabs some of which weigh seventy tons. Although not polished, the slabs that make up the uppermost chamber walls feel as if they were run through a planer machine. Only minute depressions remain where crystals once existed, but were torn out by whatever process surfaced the slab. They are flat to the touch.

Figure 1.1 Vast amounts of granite rubble surround Giza’s third pyramid.
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Amazingly, the second (middle) and third pyramids were cased in granite, some of which still remain to this day. Even more amazing, the second pyramid has retained its pinnacle of granite casing. Neither the third pyramid nor the Great Pyramid contains casing stones near their peaks.

Why the second and third pyramids were cased in granite is a mystery. It may have been for the beauty of granite’s sparkling quartz, yet a sizable portion of the casing stones’ were never finished on the third pyramid, but were left rough and uneven. Its uneven and bumpy exterior makes for a curious sight. An area of smooth, finished casing stones rests next another area where each and every stone is rounded displaying a ‘bumpy’ appearance. Evidently, it was more important for the granite casing stones to fit the inner limestone course work than have a smooth, finished appearance. Some theorists believe that the granite casing stones were first put in place then cut to a smooth, flat finish. Such a technique would ensure flat and even sides, but enough granite exists at the base of the pyramid to suggest that it has been fully cased, yet only a small section near the ground level appears to have been leveled.

It might also be the case that granite was chosen for its functionality and not for its aesthetics. Granite is erosion resistant and would have been an apt choice for siding if the desired structure was intended to last for an indefinite period of time. On that point, it certainly appears that the pyramids builders succeeded.

Uniquely, although no one knows why, the third pyramid has retained a greater percentage of its casing stones than the other two, and boasts a granite pavement of megalithic proportion. Each pavement stone is nearly four foot high. Standing there amidst these humongous blocks I felt like I was in the Land of the Giants. Around the base of the third pyramid are piles of granite rubble; boulders really since the size of the blocks is incredibly large.

Figure 1.2 Not all casing stone of the third pyramid were cut smooth.
The descending passage of the third pyramid is also lined with granite. Discovered in 1908 by George Reisner, the passageway was buried, “covered with a tangled mass of great granite blocks.” According to Reisner, under his direction Egyptian workers removed several hundred pieces of granite weighing anywhere from one to eleven tons from the around the pyramid’s entrance.²

How the granite casing stones of the pyramids were removed is unknown. Perhaps a major earthquake occurred at some time in the remote past. The field of rubble east and south sides of the middle pyramid and the piles of blocks and rubble around the third pyramid suggests that an earthquake might have been the cause. Perhaps later, scavengers pilfered only the lighter stones, and stones that offered the easiest access. It might also be the case that demolition teams climbed to the top of these stone peaks and pried away the casing blocks one by one.

Whatever happened, during more recent times, scavenger crews attempting to harvest the granite crop met the stubbornness of hardened volcanic stone. Whoever was attempting to break and tow away ready-made granite blocks found it a futile venture. A good portion of the granite blocks littering Giza’s landscape display chisel furrows, deep cuts, where someone attempted to split the block in half. Today, such acts are no doubt a crime but for those who chose to scavenge the pyramids it certainly was easy access to granite already quarried. At that time, the pyramids were likely derelict structures anyway.
Figure 1.4 Numerous granite blocks with chisel grooves litter the base of the third pyramid. In vain, scavengers tried to split these blocks.

Figure 1.5 Granite and limestone rubble field on the south side of the second pyramid.
Unlike the third pyramid there are no piles of rubble at the base of the second pyramid. However, on the east side of the middle pyramid, within a field of granite and limestone rubble there exists a clue as to the pyramid’s purpose, a granite trough emerges from the sand. Why a trough was a part of the pyramid complex suggests that its builders built for functionality. Presumably, since a trough was part of the design, the complex might have had something to do with water, possibly irrigation.
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Figure 1.8 Curved granite object with a few hundred feet east of the middle pyramid

Figure 1.9 Curved granite object displaying three surfaces
Figure 1.10 Curved granite viewed from the north

Figure 1.11 Reverse angle of curved granite object
Figure 1.12 Close up view from the north
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The most striking aspect of this granite pillar, besides its perfect shape and smoothness, is that three surfaces come together at its base, two flat surfaces and one curved. Next to this granite marvel lays a square pillar inscribed with hieroglyphs, and another piece of curved, smooth granite. Built on a smaller scale than the pyramids, and carved with elegance, the buildings from which these pieces came from must have been for human occupancy or use.

There is nothing left of the structure or structures these unique granite artifacts were once a part of. Like the casing stones of the pyramids, the buildings of Giza offered easy access to already finished granite. Close to the ground, they were likely the first structures to be disassembled and carried away to be used as building materials elsewhere.

The Sphinx and Valley Temple

In front of the Sphinx Giza’s builders erected two temples. The northern temple is known as the Sphinx Temple and the other, the Valley Temple. Like the area surrounding the middle and third pyramids, granite rubble litters the area surrounding the Sphinx complex, particularly in the Valley Temple’s east yard.

Although the Sphinx Temple at one time was faced with granite, all that remains is its inner limestone core. However, much of the Valley Temple’s granite is still in place. The Valley Temple’s front side (east) is lined with megalithic granite blocks, each nearly six feet tall. The granite pillars and lintels that makeup the temple’s interior is also largely still intact. It’s a spectacular site even though the beauty of the pink granite is masked by the yellow talc-like dust of the desert.

Figure 1.13 The Valley Temple (left of the Sphinx) and the Sphinx Temple (right)
Figure 1.14 Granite pillars and lintels of the Valley Temple

One peculiar aspect of the Valley Temple is the manner in which corners were created. One would expect a corner to be created by the staggering of two different sizes of blocks, much in the same way bricklayers make a corner today. Instead, (see figure 1.15) the corner is built into the blocks themselves and alternated between the adjoining walls. A more exquisite example of technical know-how rests on the south side of the Valley Temple, and is perhaps the most precise granite carving in Lower Egypt. Although what this broken block of granite was used for is unknown, it was obviously sculpted for decorative purposes. The face of the granite block was carved in the shape of the letter ‘S,’ (see figure 1.16) and the end of the rolling ‘S’ curve the granite squares off to form a squared face. Its surface is still smooth to the touch.

My guide assured me that this unique granite block was carved by hand but did not comment on how or with what tools. Considering that this ornate block is nearly four feet tall and six feet long weighing nearly twenty tons, if not more, and was part of a much larger piece, carving it into a perfect ‘S’ shape by hand defies common sense, given the simple hand tools available to the ancient Egyptians.
Figure 1.16 Ornate granite block on the south side of the Valley Temple
Figure 1.17 Ornate granite viewed on end from the west

Figure 1.18 Ornate granite viewed on end from the east
Further west along the Valley Temple there lies a second block of granite with its face also curved in an ‘S’ shape. Although this second block is not a mate to the first block, its appearance is similar and may have been used in the same purpose as the first block. One possible use for this style of blocks is the decorative trimming on the top of the temple wall, such as the temples of Esna and Edfu in Upper Egypt.

Walking west, past the Valley Temple, east of the middle pyramid and south of the causeway, there is a maze of rock-cut tombs and crypts built into the small rolling hills of the plateau. Rock, sand, ancient brick structures, and modern restorations all blur together. It is a desolate site. The rock in which these tombs are carved is the same yellow limestone formation that the Sphinx is carved from. Amusingly, the guides call this area ‘the Sphinx Museum.’

A museum should require a structure, shouldn’t it? Maybe not in Egypt, on the map I have there is an icon for a museum at the Sphinx area. I guess it must be an outdoor museum.

Whatever the area is called, I followed my guide though this long-abandoned cemetary moving as fast as he wants. Little of what he points out as a tomb or crypt can be remembered. I am too busy taking pictures. So, I am unsure how many tombs were pointed out. But the ones I visited number four. It doesn’t matter, though. The area resembles a ‘no man’s land’ one might see in an old World War I film. Almost everything of interest has been moved to the Cairo Museum. The only statues that remain are those carved into walls or broken so bad there is little need to pay someone to move them.
What is very noticeable is that the tombs in the area were hand cut with chisels, and the statues as well. Chisel marks are well defined in tunnels and chambers throughout the area. In a few crypts, door posts and headers were finished and inscribed with hieroglyphs. But nowhere in this area is there anything resembling the magnificence and the precision of the pyramids or the granite pillars of the Valley Temple. Then, out of the corner of my eye, far to the south, I noticed four dark red pillars lightly coated with Saharan dust.

_Giza’s Unknown Temple_

Standing at the far southern edge of this no-man’s land of cut-rock tombs is a place not featured on any Giza map, at least the maps I have seen. Yet, even from a distant it is easy to see, once you crest the cemetery’s final dune. Four red pillars stand erect in font of what appears to be a rock shelter, one pillar taller than the rest. It’s an unusual scene for the area. The dark red pillars stand out against a background of Sahara yellow. Beyond these giant pillars of granite the land flattens outs into a cordoned area reserved for archeologists currently working on the plateau. There, behind barbed wire, ten huge granite blocks neatly lay, placed in a row. Armed guards are on station at various strategic points, overhead on the rocks above as well as in the distance at the area’s perimeter. Most likely an important site since it is also off limits.

I visited the so-called Sphinx ‘Museum’ twice, each separated by a week. The second time a man dressed in a long blue tunic stopped my friend Judd and me, and would not let us pass into the area of the giant pillars, the point where I took the photo in figure 1.20. I desperately wanted another look. Nonetheless, the man in the blue tunic looked serious as he walked toward us with outstretched hands. Judd tried to snap a photo but the man waved his hands in an attempt to spoil Judd’s picture. Whatever he was saying in Arabic my ‘Sphinx Museum’ guide that day understood and quickly turned us back.
I asked why and received the answer I was expecting. The area below, where the red granite pillars are, is a restricted area. Ironically, the man who turned us back was my guide the previous week! And, a week ago he took me wherever I wanted to go including to the red granite pillars of the unknown temple. I protested but to no avail – “this is the same man who brought me here a week ago!”

My guide said, “He doesn’t have the heart today.” What that means, I found out, was that the “big boss” was here today. I am not sure who the ‘big boss’ is, my guide did not say, but I venture to guess that it was Zahi Hawass himself. There is no bigger man on the plateau.

There has been talk of new finds in the area of rock-cut tombs and that may have been the reason, which of course means that there are new excavations in the area which explains the barbed wire. Whatever the case, the man who turned us back gave me an unlimited tour the week before. He spoke English quite well, and without a doubt was the most cordial guide I encountered.
The week before I received a close up view of the giant pillars; like the Valley Temple they were made from solid granite. But these pillars are very different. Fluted along their vertical axis and inscribed with hieroglyphs surely they held a simple yet powerful beauty for its builders. (Figure 1.22 and 1.23) Although the structure from which these stones are from no longer exists, they must have been a part of the building’s exterior. I wonder. Do the hieroglyphs tell of a king or queen? Or, do they pay tribute to a god? Perhaps, they tell of neither and are simply a testament to the knowledge and skill of civilization that created them.

One of the pillars, the only pillar not fluted, likely weighs in excess of fifty tons. When new and unbroken it may have weighed over a hundred tons. On the pillars that are fluted, the channels in the granite are nearly an inch deep (Figure 1.22), and perfect in each pillar. The southernmost pillar, still anchored in its original paving stones, is also fluted on its backside’s corners, a most impressive display of skill. (Figures 1.24 and 1.25) Although the surfaces of the pillars are not smooth, they are flat. The wind, most likely, has taken its toll over thousands of years and blasted out the weaker parts of the rock resulting in a slightly rough texture to the surface.

There is more to this unknown temple than I had access to, although the rest of it lies behind locked iron gates. One pillar is visible just beyond the yellow-painted iron bars. (Figure 1.27)
Figure 1.24 Fluting on the granite pillars is nearly an inch deep

Figure 1.25 Hieroglyphs carved into granite pillars of the unknown temple
Figure 1.26 Fluted, red granite pillar of an unknown Giza temple
Figure 1.27 Reverse side of pillar in Figure 1.26
Figure 1.28 My guide adds perspective to this size of the unknown temples’ pillars

Figure 1.29 Another part of the temple sits behind iron gates
A New Discovery at Giza

Aside from the magnificent red granite pillars of the unknown temple, the rock-cut cemetery contained another surprise, which according to my guide was the latest discovery on the plateau. He asked if I would like to see it. “Sure,” I replied, although unsure if it was the latest discovery or not. After seeing it, the baksheesh I paid to the guard for a peek was worth it, particularly since I had traveled nearly halfway around the world.

With my guide leading we approached an area that was fenced off with barbed wire. Beyond the barbed wire there was another man waiting, who took us down a northerly path with a turn here and a turn there. We ended up at a passageway in the west side of the short limestone cliff. Down we went. I didn’t have a flashlight but the guardian of this chamber had a small candle. He lit it with my lighter and all at once a beautifully carved stone box came into view.

![Figure 1.30 A stone box deep in the Giza cemetery](image)

I am not sure if the box was carved from granite, diorite, limestone, or other type of rock. Whatever it was, the inside corners of the box were square. Its exterior was also square except for the lower right-hand side which appeared to be damaged. The lid was intact complete with lifting nodes at each end, and curved across the width of its body. Although the surface of the box was flat in most areas it was not smooth. More or less the texture of the box’s surface was rough in spots. If this were the original condition of the box we may never know.
Traditionally, all stone boxes are referred to as sarcophagi regardless of the box’s style. However, boxes that are known to be sarcophagi typically are attributed to later years. This granite box, if created when the structures were believed to have been built, is attributable to the fourth and fifth dynasty, which means it is more than four thousand years old.

**Sakkara**

About ten miles south of Giza is Sakkara, which according to Egyptologists, is the Old Kingdom’s capital of the first Dynasty and second Dynasty (2920-2650 BC) and the birthplace of the pyramid. According to Egyptologists, during the third dynasty (c.2800 BCE), the Pharaoh Djoser decided that the standard mastaba wasn’t enough. So, under the guidance of the architect Imhotep a standard mastaba was transformed into a stepped pyramid.

![Figure 1.31 Sakkara's Step Pyramid](image)

Sakkara is also the only place where a large cache of unique types of stone housewares have been found, although Sir William Petrie found fragments of similar bowls at Giza during the late nineteenth century. Discovered in an elaborate underground tunnel system, much of the stoneware is inscribed with symbols from the earliest kings of the predynastic era. Some have argued, because of the primitive style of the inscriptions, that it is unlikely that those who fashioned the bowls also made those signatures. It is possible that predynastic Egyptians acquired the stoneware some time after it was made, and then marked it with their sign of ownership. A number of these stone artifacts are on display at the Cairo Museum. Unfortunately, however, photographs are no longer allowed inside the museum.
The Stone at Abu Rawash

In the center of open bowls and plates, where the angle of the cut changes rapidly, one can see a clean, narrow, and perfectly circular line made by the tip of a cutting tool. Unmistakably, these tool marks were from lathe manufacturing (rotating an item on two spindles so the reduction of material is even on all sides). Soft stone is relatively simple to machine and can be worked with simple tools and abrasives; however, the level of precision used in manufacturing these items rivals twentieth-century industry. Delicate vases, made of brittle stone such as schist, were finished, turned, and polished to a flawless, paper-thin edge. One nine-inch bowl, hollowed out with a three-inch opening at its top, was flawlessly turned so that it balances perfectly on a rounded and tipped bottom. This tip is the size of an egg’s rounded point, requiring a symmetrical wall thickness without any substantial error.

![Figure 1.30 Granite debris at Sakkara](image1)

![Figure 1.31 Granite column at Sakkara](image2)
Figure 1.32 Uniquely carved granite at Sakkara

Figure 1.33 Inscribed column at Sakkara
The Stone at Abu Rawash

Elegant items made from granite indicate not only an accomplished level of skill, but perhaps an advanced method of cutting. Pieces made from granite, porphyry, or basalt cores were hollowed out with a narrow and flared opening, some of which have long necks.

The most historically intriguing discovery at Sakkara are the pyramids which house what has become known as “The Pyramid Texts,” a set of hieroglyphics dating to the Old Kingdom’s fifth, sixth, and eighth dynasties inscribed on the walls of five pyramids. In 1952, the renowned Egyptologist and Professor of Semantic Languages Samuel Mercer (1879-1969) composed the first complete translation of the Sakkara Pyramid Texts and concluded that they appear to have emerged as a fully-fledged collection of mortuary texts without any precedent in the archaeological record. Since the texts are composed of distinct utterances, with no strict narrative sequence linking them together, scholars believe they were not composed specifically for the purpose of pyramid inscription, but may have had earlier uses.

Like Giza, Sakkara is littered with granite debris. Although whatever structures that existed have been destroyed, what evidence remains suggests that these structures were also made or cased in granite.

Abu Sir and Abu Gorab

At the twin sites of Abu Sir and Abu Gorab, not far from Sakkara and a few miles south of Giza, two granite columns of Egypt’s fifth dynasty rise into blue skies amidst a field of granite ruins, in front of three pyramids. Standing on the remnants of a black basalt stone patio, once a center of activity, you can’t help but wonder what happened to create the granite and limestone rubble that surrounds you. Was the destruction a result of a war or catastrophe? Even in its ruinous state Abu Sir is beautiful.
A granite pillar ornate with hieroglyphs lies next to two standing granite ‘palm’ columns, as does the fallen capital of a third column. Another column made from solid granite lies on the ground amidst a vast amount of granite chunks weighing anywhere from a hundred pounds to several tons. The bright, pink, beautifully carved granite column sparkles in the sunshine. I have never seen a column made from solid granite so intricately carved with perfect precision. It looks as if it could be new, placed there by some Hollywood production crew as a prop.
The Stone at Abu Rawash

While standing before this broken beauty of a column, I could not help but think of the table legs I had made more than thirty years ago in high school shop. The table I created nearly matched the mix of cylindrical and square features of this granite column. I used a lathe, but how the columns at Abu Sir came to be is a mystery. They appear to be carved from a solid block of granite.

Like Giza, at the twin complexes of Abu Sir and Abu Gorab, the suggestion of water as a motive for building pyramids is much stronger. At Abu Sir a trough had been built that runs through the complex and down the hill. At both sites, Abu Sir and Abu Gorab, water basins were clearly part of the structure.

Figure 1.37 Limestone trough built on the slope of the hill that leads to the Abu Sir Complex
Figure 1.38 A water basin at Abu Sir

Figure 1.39 Stone water basin at Abu Gorab
Figure 1.40 Abu Gorab’s Mysterious Stone Platform

Figure 1.41 Nine water basins lined up at Abu Gorab
Within Abu Sir’s temple, which is believed to have been the mortuary temple of the King Ptahshepses, two granite boxes were placed in a pit at the west end of the temple courtyard. Getting there from the temple was easy. At Abu Sir, along the eastern wall of the temple, and to the rear there was a low wall, three feet high that had to be scaled. Over the wall there is a center court with inscribed limestone columns. At its west end, stairs lead to a pit, and in the pit lay two precision carved, pink granite boxes, one smaller than the other. Elegantly and expertly carved, these granite boxes, which are believed to have been part of the ancient Egyptian’s burial practices, have Egyptologists stumped.

![Two perfectly carved granite boxes of Abu Sir](image)

**Figure 1.41 Two perfectly carved granite boxes of Abu Sir**

**Mysterious Granite Boxes**

These granite boxes are one of ancient Egypt’s greatest mysteries. Several boxes have been found still sealed, yet upon opening were discovered to be empty. Whatever the boxes may have been used for, today, such workmanship requires not only mechanization but a bit sharp enough, and hard enough, to
The Stone at Abu Rawash

remove granite. The construction of such artifacts as the granite column and boxes receives little attention by historical ‘experts.’ It’s easy to understand why. The beauty and level of precision, particularly in the flowing palm leaves at the top of the column, and the square shouldered box lid with a rounded belly, is unsurpassed even today.

If the designer’s intent of the granite box were to be a coffin then why are there two at Abu Sir? Was the larger one for the king and the smaller one for the queen? If so, then why do they lack inscription?

In the course of three thousand years of ancient Egyptian civilization two types of granite boxes have been discovered. One type is clearly a coffin and is inscribed with hieroglyphs. A number of these are on display at the British Museum in London and at the Cairo Museum in Egypt.

The second type lacks inscription, is perfectly square, and its lid is curved across the width of its body. Some of the lids have lifting nodes, bulbous protrusions at each end of the lid. It’s easy to distinguish between these two types of boxes not only because of the difference in appearance but also from the quality of workmanship. The quality of the type one granite box is high while the quality of the second type of granite box is lower, and has obviously been created by hand with simple tools such as stone ‘pounders.’

Figure 1.42 Type 1 (high quality) pink granite box at the British Museum
Figure 1.43 Type 1 (high quality) pink granite box at the Cairo Museum

Figure 1.44 Type 2 (low quality) granite box at the British Museum
There is a third type of granite box that is only found at Sakkara. This type 3 granite box is located underground in a long tunnel carved into the bedrock, a little northwest of the Step Pyramid. Officially, the underground tunnel was dug during the eighteenth dynasty as a sacred tomb for the Apis bull. According to Egyptologists, this special bull lived a life of royalty as the physical manifestation of Ptah, the god of creation who spoke the world into existence. In myth, the Apis bull was born of a lightning bolt. Upon death, the royal bull he was embalmed at Memphis and then buried in Sakkara’s Serapeum in an extraordinarily large granite sarcophagus, a type 3 granite box.

The Serapeum was first discovered by Paul Lucas in 1851. A year later, Auguste Mariette uncovered an ancient processional route that the Greek geographer Strabo had described in the first century. In November, he unearthed the entranceway to a grand underground tunnel and discovered it contained twenty-four massive granite boxes, each weighing close to eighty tons. However, the huge granite boxes were empty, and believed to have been emptied of their contents long ago. Later, however, Mariette did uncover intact burials. One was attributed to the reign of Horemheb and two others to the reign of Ramses II. The burials attributed to Ramses, which were two large gold coffins, contained the remains of Apis bulls which had been dismembered and individually wrapped. Also discovered were four large canopic jars, each displaying the head of man, containing the internal organs of the bulls. A third coffin contained a mask made of hammered gold and the mummified remains believed to be Khamwese, the son of Ramses II.

Like the type 1 granite boxes at Abu Sir, the British Museum, and the Cairo Museum, the Serapeum’s granite boxes were finished with high accuracy. According to expert machinist Christopher Dunn, their corners, both the inside and the outside, are incredibly square. The inside corner of one box measured 5/32 inch, a very tight corner even in today’s world of computerized precision manufacturing. Dunn also measured the flatness of a granite lid to be accurate to 0.0002 inches. Incredibly, on one of enormous large granite boxes the tolerance between the box and its twenty-seven ton lid was .00005 of an inch.
Such precision as these granite boxes displays is very difficult to explain, impossible really, when excluding high quality and high precision tools. It is a matter of physical geometry, meaning that in order for the box’s lid to be square with its two inside walls, the inside walls have to be exactly parallel along its vertical axis. Furthermore, the top edges of the box (all four sides) need to be exactly the same height in order to establish a plane which is square to the sides. So, whoever created these boxes made sure that the inside walls were flat vertically as well as horizontally, and they also made sure that the surfaces were square and parallel. This is a very difficult task to accomplish without precision measuring and cutting tools, even more so when the sides of the box are nearly six feet apart.
The Stone at Abu Rawash

In London’s British museum two granite boxes share the same isle but diverge in the quality of workmanship. A pink granite box, nearly identical to the one at Abu Sir, is a precision quality product, symmetrical in its creation. (See figure 1.42) Its overall shape is square with beautiful fluting evenly spaced on each side of the box’s four sides. Its lid has square shoulders but rounded along the vertical axis. In contrast, the black granite box is roughly square at one end but rounded at the other. The hieroglyphs carved on its exterior resemble scratches more than they do inscriptions. The same is true of granite boxes at the Cairo Museum. How can the divergence of quality be explained?

One explanation is that the boxes of lesser quality were crafted from amateurs who were trying to replicate the work of professional. Another is that boxes of lesser quality are older and a progression of workmanship occurred over thousands of years. A third explanation is that the difference in quality of workmanship is because the boxes are from two different civilizations. Nonetheless, the official explanation is that the boxes are from different time periods of the same civilization. However, the difficulty with this last explanation is that the older the boxes are the boxes that display a higher quality of workmanship. The granite boxes from Abu Sir and Sakkara are from Old Kingdom time, which means that ancient Egypt’s technical skills declined over time.

How is it explained that ancient Egypt began civilization with the ability to carve high quality objects and then lost that ability through the course of the next thousand years? A more baffling question: why would anyone quarry a hundred ton block of granite for the purpose of hollowing it out to make a covered box, and then bury it deep within the earth? And, how could they accomplish it with such precision that today’s mechanized granite industry would be hard pressed to duplicate their efforts?

Figure 1.48 Attempt to split a granite block by using hand tools

It is argued by Egyptologists that everything in ancient Egypt was manufactured with the simplest of tools, specifically, copper chisels and wooden mallets. But there is great difficulty in accepting this explanation. Whoever pilfered the Giza Plateau in search of building materials for their own needs used chisels, and possibly chisels that were made of iron, to break the available stones into more manageable blocks. The futility they faced in using hand tools is obvious. More importantly, the quality of chisel
work, as seen in Figure 1.48 which is a typical sight near Giza’s third pyramid, is nothing like the precision of such artifacts as the granite boxes of Abu Sir or the Serapeum.

Whoever crafted the 4,000-year old granite boxes did so with incredible precision. Perfectly straight and square corners (Figure 1.49) are easy difficult enough to do with wood, but with granite the weight of the material and strength of the tool tip required to make the cut are prohibiting factors. Add to that an even curvature of the lid (Figure 1.51) as well as a beveled lip perfectly cut into the top of the box. (Figure 1.50)
Still, the most interesting aspect of Abu Sir’s pink granite box is that a mistake is visible on the lid of the larger box. (Figure 1.52) On the corner labeled D a rounded gouge is visible where the square shoulder of the box meets the curved part of the lid. Clearly, a workman would not have stood over this granite pounding away to make this indentation. The only reasonable explanation is that the operator of some kind of powered machine pressed in too deeply, and by accident made this mark.

There can be only one of two possibilities. The builders of these boxes and the structures on the Giza Plateau, Sakkara, Abu Sir, and Abu Gorab had developed a technique of cutting, shaping, and moving granite by hand that has been lost to history or they were using tools powered by something.

Although the precision with which these granite boxes were carved is incredible, a more incredible feat of workmanship is carving of the Great Sphinx. Despite its advanced state of erosion the Sphinx is the most elegant monument not only in Egypt, but the world. No one knows why it was carved, or even when it was carved although Egyptology’s preferred date is during the Old Kingdom’s fourth dynasty, around 2600 BCE.

However, there difficulties accepting this date; the problem has as much to do with history, as it does with the geological evidence.
Figure 1.52 Inner corners of Abu Sir’s large granite box
2 - A Prehistoric Sphinx

The history of ancient Egypt is one of the most controversial areas of all the historical disciplines. At the center of this controversy is a two hundred foot long, sixty-five foot tall sculpting of a lion with a human’s face, the Great Sphinx. Although prudent to think that such a great monument to civilization would have a clearly defined history; who carved it, why, and when, the story of the Sphinx has been lost to history. For millennia the Sphinx lay quiet buried in sand up to its neck, and it wasn’t until 1789 with Napoleon’s invasion of Egypt that western civilization became interested in Egypt’s history and the Sphinx. And, it wasn’t until 1822 that Egyptian hieroglyphics were deciphered and once again readable.

Applying a history to the Sphinx and to ancient Egypt came at a time when western society was moving through a period of great change, particularly in how the philosophical tenants of life were viewed. The latter half of the nineteenth century was a highly charged period of shifting paradigms, particularly in Britain. Under the scholarship of Charles Lyell and later Charles Darwin the biblically based view of history was being replaced with the concepts of evolution and uniformitarianism. Although wary at first, academia wholly embraced this new view of history by the turn of the century.

Science became paramount in understanding why things are, and soon became the mantra of all the academic disciplines even for those programs of study that had little to do with science. Nonetheless, they too became science, albeit ‘social science.’ This is not to say that those disciplines are not scholarly and don’t use systematic ways in their approach to understanding history. But it must be recognized that what happened so long ago is more a matter of detective work than it is science.

Science requires experimentation and replication, the stuff of physics, chemistry, and biology. In studying the past such methodology can never be applied to cultures or beliefs or how ancient culture viewed its own history. Such things can only be inferred through the historian who lived closest to the time period in question. Although radiocarbon dating has proven to be a valuable asset in many circumstances, the judgment of the principal archeologist is often the deciding factor for which dates are valid, and which dates are anomalies to be excluded. As a result, for the general public the answers to the past do not lay in the excavated artifact. Rather, the interpretation of the artifact.

The Birth of Modern Egyptology

Shortly after this sweeping intellectual change to a theory of evolution, Sir William Flinders Petrie approached ancient Egypt with an unbiased eye and systematic methods. So successful were his systematic methods of excavation that, in 1892, he became the first Professor of Egyptian Archaeology and Philology at University College, London, courtesy of an endowment by the wealthy journalist Amelia Edwards.

In his attempt to date the birth of dynastic Egypt, Petrie found a scarcity of objects before the fourth dynasty and a sudden change in custom. Although difficult to explain, he noted that “the civilization that we find before us in the earliest known history appears elaborate and perfect.”¹ According to Petrie, it wasn’t until later that slow changes in fashion and taste began to influence the Nile civilization. This earlier culture were not just masters of the arts, Petrie writes, but “also of combined labor, of masonry, of sculpture, of metal working, of turning, of carpentry, of pottery, of weaving, of dyeing, and other elements of a highly organized social life.”²

Although he could not conceive of any structure being built prior to 3000 BCE, the magnificence and complexity of what he saw was puzzling. Petrie found it difficult to attribute the massive Egyptian projects of the third and fourth dynasties to a series of predynastic cultures which did not have the capabilities to erect such monuments; claiming that an older, more advanced civilization such as
Donnelley’s Atlantis was clearly out of the question. At that time, the ‘Atlantis Syndrome’ had taken the
general public by storm, particularly in America, but such ideas crossed the grain of the emerging
uniformitarian paradigm. For Petrie, there had to be an explanation based on the archeological evidence
alone.

At Meidum, thirty miles south of Giza, Petrie found burials of what he viewed as two separate
Predynastic cultures. The more recent culture always buried their deceased with the body at full length,
of which Petrie attributed to nobility. The older culture in a contracted form, curled up in nose to knees
fashion lying on their side facing east with their heads to the north. Petrie interpreted the Meidum
burial as a place where not only two separate occupations occurred but two separate races. The
earlier culture must have been the leadership and the driving force for the fourth dynasty. He called this
unknown culture the ‘dynastic race’ and assumed that they could not have been from Africa, in sync
with the social and political thinking of the day. Thus, the magnificence of ancient Egypt was attributed
to race of men not native to Africa.

Petrie believed he had discovered evidence in the Egyptian records that “a great European
confederacy” had invaded the Nile Valley multiple times – “Greece, Asia Minor, Italy, and Libya, all
leagued together.” Thus, the grand Egyptian civilization of monuments, obelisks, and temples was the
result of an “incoming race” who found a native population with beliefs and customs very different from
their own. At Meidum, these two races, one aboriginal and the other from abroad, had not yet mingled.
Later, with some evidential support the focus of the dynastic race shifted to Mesopotamia, and lasted
well into the middle of the twentieth century.

**Egyptology Today**

Today, in a new era of Egyptology Petrie’s dynastic race theory is all but forgotten, and is viewed as
insensitive and politically incorrect thinking. According to modern Egyptology, primitive peoples, forced
to move by the increasing dryness of West Africa, migrated east to the Nile Valley during the last quarter
of the fourth millennium BCE to begin Egyptian civilization. With them came their religious beliefs and
their mythology. The growing population in the valley created a unique circumstance that enabled early
Egyptians to band together for the common good and a common goal. A large labor supply and
bountiful harvests led to overall prosperity, and the kings of early dynasties ordered the construction of
public projects. Colossal statues, temples, and tombs were built with simple hand tools and massive
manpower.

According to Egyptology’s interpretation of the evidence, the influx of people into the Nile Valley
gradually developed into farming settlements. However, it is unknown precisely when agriculture
developed, or by what method, or who, if anyone, introduced it in Egypt. A thousand-year gap in the
archeological record exists between river settlements and the true farming villages of predynastic Egypt.
Yet, it is in this thousand-year period where nearly all the typical characteristics of early Egyptian
civilization appear: animal domestication, agriculture, stone and metal working, as well as belief systems
and burial customs.

The earliest signs of a developing civilization began approximately 4500 BCE when urban planning
and the development of architecture first appeared in the Nile Valley, as did the deification of the cow.
Within five hundred years city-states developed at Naqada, Hierakonopolis, Gebelein, and Abydos. In
time, these cities resulted in the mixed people and culture of the late predynastic era, referred to as
Naqada III. Predynastic societies soon began to form in the north as well as the south. Southern cultures,
particularly the Badarian, were almost completely agrarian, but their northern counterparts, such as the
oasis dwellers of Fayum still relied on hunting and fishing.

Furniture became a focus of the craftsmen, as well as the aesthetic value of goods. Pottery was
painted and decorated, particularly the black-topped clay pots and vases typical of this culture. Bone
A Prehistoric Sphinx

and ivory combs, figurines, tableware, and jewelry of all types and materials have also been found in great numbers corresponding to dates between 3300 and 3000 BCE.

An exodus of people from the desert areas of southern Egypt created new settlements in the Nile Valley. And with a growing population the final act during predynastic times was coming to fruition, the unification of Upper and Lower Egypt between 3150 and 3110 BCE under a king named Nar-Mer, according to a carved ceremonial cosmetic palette of black basalt rock.

On this carving, the king is shown wearing the white crown of the south and holding a mace ready to crush the head of his northern enemy. The same figure is also depicted wearing the red crown of the north while a bull - assumed to be a symbol of the pharaoh’s power - rages below, smashing the walls of a city and trampling yet another foe.

Although there are still more questions than answers regarding the establishment of Egyptian civilization, a number of sources point to a victory of the south (the Naqada culture) over the north (the Maadi culture). Yet, the resulting social system of the first dynasty resembled the north more than the south. So exactly who conquered who, is still unknown. Any explanation remains purely hypothetical.  

In Upper Egypt (southern Egypt) the difficulty is that there is a lack of sufficient data about settlements to make theoretical generalizations. The problem is there is little archaeological evidence that demonstrates the rise of political elites, regional integration, and the formation of the earliest state, much less the process of unification which led to the first dynasty.

Nonetheless, there appears to be a consensus that the emerging Egyptian state had its roots in Upper Egypt, in the Naqada culture. Burials, ceramics, and other artifacts show a growth from the predynastic to the dynastic, which cannot be demonstrated from the culture of Lower Egypt. However, precisely how this Naqada expansion northward into the delta region occurred, and when, is still a mystery. Nonetheless, Egyptologists are certain that one of the first tasks this new civilization accomplished was to carve a 200-foot long, 65-foot tall lion.

Figure 2.1 The Sphinx and its enclosure
West and Schoch Re-Date the Sphinx

With its name is derived from the Greek word *sphingo* or *sphingein*, which means to strangle or to bind tight, the Great Sphinx is an enduring, enigmatic icon of ancient civilization. Although no one knows what the earliest Egyptians called it, during the latter half of the second millennium BCE it was referred to as *Hor-em-akht* (Horus in the Horizon), as *Bw-How* (Place of Horus), and also as *Ra-horakhty* (Ra of Two Horizons).

Sitting in a rectangular hollow the Sphinx was excavated and carved from the bedrock limestone permeating the Giza plateau. Only the head and uppermost portions of this monstrous lion lie above the surface of the plateau. When the Sphinx was being carved, the limestone rock removed from this area was used to build a temple directly in front of the Sphinx, to the east. According to Egyptologists, this was accomplished during the Old Kingdom’s fourth dynasty, between 2575–2467 BCE. However, not everyone with an interest in ancient history was willing to accept a fourth dynasty date for the Sphinx.

Author and independent researcher John Anthony West teamed up with the Boston University geologist Dr. Robert M. Schoch, and in 1990 embarked on a project to investigate the possibility that the Great Sphinx was carved, at least in part, before 2500 BCE. West believed the weathering of the Sphinx and its enclosure was the result of rainwater, which would have had to have occurred prior to the third millennium BCE when North Africa was receiving rainfall.
A Prehistoric Sphinx

Schoch, a scientist and skeptic, initially believed that he would be able to convince West of the error in his unconventional views concerning the Sphinx and its associated structures.\(^5\)

I found that West had a very extreme idea that the Sphinx was thousands of years older than the Egyptologists thought. I thought this was a long shot, but I thought that, maybe, West was onto something. I thought it was improbable, but it was worth looking at further. I am a curious type of person.\(^7\)

So, Schoch and West visited Egypt in early 1991 to study the Sphinx and its enclosure. After a detailed survey of the Sphinx’s erosional features, Schoch was convinced there was more to the story than established history was able to explain.

At Giza, Schoch observed that the Sphinx and the Valley Temple had been constructed in two stages and had undergone repair, even during ancient times. He also ascertained that the Sphinx temple, and possibly the Valley Temple, was constructed from limestone blocks quarried from the Sphinx enclosure, most likely while the Sphinx was being carved. If true, this meant that the temple structures must be as old as the Sphinx itself. Later, the ancient builders faced these temples with granite ashlars (carved smooth stones) in order to cover weathering since the temple had been erected.

Where the Valley Temple’s walls have been stripped of their granite facings, an irregular surface is visible. This uneven surface, “higgledy-piggledy” as Schoch refers to it, is apparently a result of its rehabilitators cutting back and smoothing out the weathered walls before applying the granite facings.\(^8\) It looks “higgledy-piggledy” because only enough limestone was removed in order to set the granite ashlars in place.

In various places, the backside of the granite siding was cut to fit the bumpy patterns of the wall. In this way, they matched the granite blocks to the shape of the irregular weathering patterns on the limestone substructure. For Schoch, it was apparent that the weathering of the structures was already substantial even in ancient times.

Schoch also noted that there were four distinct types of weathering exhibited in the area in and around the Sphinx: rainwater, wind, flaking, and disintegration (or dissolution). Weathering from rainwater, Schoch concluded, is visible on the body of the Sphinx and on its enclosure walls. This is clear, a “textbook example” as Schoch refers to it, from the rolling and undulating profile of the enclosure walls, particularly the southern and western walls. According to Schoch these erosional feature are well developed and prominent within the enclosure. Furthermore, it is also visible where flowing water followed joints and faults in the rock.\(^9\)

Weathering from wind, which is distinctly different from erosion by rain, is also evident on the Giza Plateau and probably began, Schoch believes, during Old Kingdom times (2650–2152 BCE). Various Old Kingdom tombs and land features south and west of the Sphinx, carved from the same layers of limestone as its body, are exemplary of wind erosion. At Giza, on hard layers of rock faces, carved on tombs and statues, are still clearly visible. But on softer layers of rock, wind and sand have gouged out deep horizontal tunnels creating a “wind-tunnel” characteristic on the rock’s surface.

One way to envision wind erosion is to think of the limestone bedrock as a layer cake. Each alternating layer of cake and icing represents hard and soft layers of stone. When the cake is cut in half, its profile is exposed and its layers are clearly visible. If you run your finger along a cake layer, the cake doesn’t give. However, running your finger along an icing layer, representing the soft stone, results in a horizontally “scooped-out” look. Such is the nature of wind erosion on hard and soft rock layers.

The third type of erosion that has affected the rock surfaces is known as exfoliation or flaking. According to Schoch, the flaking apparent on the Sphinx and temple structures occurred relatively recently (within the last two hundred years) as a result of modern causes such as acid rain and air pollution. A fourth type of weathering called dissolution exists only in a few places, such as tombs, as a result of the evaporation cycle occurring in enclosed spaces. The condensation and evaporation of water
in the atmosphere covers the rock with a very fine coating of mineral crystals, giving the rock’s surface in these areas the appearance of melted wax.

Figure 2.3 Water erosion on the southern wall of the Sphinx enclosure
Figure 2.4 Water erosion on the southwestern corner of the Sphinx enclosure

Figure 2.5 Wind erosion on a minor pyramid’s casing stones at Sakkara
Figure 2.1 Wind erosion on limestone bluffs at Giza (Approximately 500 feet west of the Sphinx)

Figure 2.2 Erosion on the west wall of the Sphinx enclosure
A Prehistoric Sphinx

In some cases, the four different types of weathering may be difficult to distinguish, with one type overlain by another; but in general, the different forms of weathering are clear and distinct. What Schoch refers to as precipitation-induced weathering is the oldest prevalent type of weathering on the Giza plateau, and is significant only on the oldest Giza structures, such as the Sphinx body and its enclosure.

Another aspect of the Sphinx that supports Schoch’s analysis is the restoration efforts that occurred during Old Kingdom times. Beginning with the ancient Egyptians themselves and continuing to the present, the Sphinx has undergone a number of repair campaigns—during the Old Kingdom in 2500 BCE; in New Kingdom times in 1400 BCE; during the twenty-sixth dynasty, 664–525 BCE; and also during the Greco-Roman era, between 300 BCE and 400 CE. During these repairs, the ruler often excavated the Sphinx enclosure from the sands that would fill its surrounding hollow when left unattended for a few decades. After each excavation, repair blocks were often mortared to the weathered body in an attempt to restore the sculpture to its original figure.

According to Schoch, the earliest repair to its surface was performed using what appears to be an Old Kingdom–style masonry technique. If true, then the Sphinx would have had to exist well before dynastic Egypt. This is to say that a few hundred years would not be enough time for significant weathering to occur that would require restoration.

Dating the Sphinx

The surface of limestone rock looks solid, but from a geologic perspective the rock is actually soft and porous. Why this is, is that once rock is cut and exposed to the atmosphere it begins to weather. And the depth of weathering below the surface correlates precisely with how long that rock has been exposed to the elements. In this process of weathering rock becomes softer. Some of the particles that make up the rock dissolve and becomes a weaker rock. How deeply the weathering penetrates into the rock below its surface depends on the type of rock, as well as how long it has been exposed to the elements.

Seismic refraction, which is the charting of geologic features through the use of sound waves, enables geologists to map the boundary between weak, weathered rock and the underlying hard limestone. Thus, by locating how deep the rock is deteriorated, an estimate can be made as to how long ago the excavation occurred.

With the assistance of the seismologist Dr. Thomas Dobecki, Schoch performed a seismic refraction survey to create an image of the Sphinx enclosure’s subsurface weathering. The results indicated that the weathering below the surface is not uniform, which strongly suggests, according to Schoch, that the Sphinx area was not quarried all at once. So, by estimating when the least weathered area was excavated, and thereby first exposed, he could estimate the minimum age of the Sphinx.

According to Schoch’s data, the front and sides of the Sphinx enclosure displayed weathering that measured from six to eight feet in depth. However, along the back (west) side, the limestone had been weathered only to a depth of four feet - a finding that was completely unexpected – suggesting that the Sphinx was not carved all at once. Alternatively, if the Sphinx was carved out all at once, it would be reasonable to assume that the surrounding limestone would generally show the same depth of weathering, six to eight feet deep.

One interpretation of these results is that only the sides and front of the Sphinx were initially carved. If so, the Sphinx would have appeared as an outcropping with its rear still part of the natural rock. Schoch believes a likely scenario is that its rear was initially carved but only to the level of the upper terrace, which today remains immediately west of the Sphinx within the enclosure.

An alternative theory is that the rear of the Sphinx was original carved from the bedrock, but only with a narrow passage existing between it and the enclosure wall. Later that passage was widened. Whatever the case may be, it is clear from the seismic tests performed in April 1991 that the limestone floor behind the Sphinx’s rear was exposed after the front part of the Sphinx was carved.
According to Schoch, if the New Kingdom restorations during the eighteenth dynasty (1539–1295 BCE) were responsible for detaching the Sphinx’s rear from the enclosure wall, then it would not be possible to account for four feet of subsurface weathering, since up to that time the Sphinx enclosure was filled with sand. Therefore, Schoch’s opinion is that Khafre uncovered the limestone floor behind the Sphinx in 2500 BCE, and as a result the limestone floor began to weather.

Schoch’s Conclusion

Based in part on his analysis of the data that the weathering of the limestone floor surrounding the Sphinx is 50 to 100 percent deeper at the front and sides than at the rear, and assuming that rear floor was first exposed to the air in 2500 BCE, the original carving of the Sphinx (its front and sides) took place between 5000 and 7000 BCE. In other words, the front of the Sphinx is twice as old as its back somewhere between 2,500 and 5,000 years older. According to Schoch this is conservative estimate. Since weathering rates are not constant, the initial carving may be even older. However, if the Sphinx was heavily weathered by precipitation at an early period in its existence, Schoch argues that it may have been carved prior to the last great period of major precipitation in the Nile Valley, which means it may closer to 10,000 years old.

Egypt experienced a period of unpredictable flooding during this era of high rainfall, referred to as the Nabtian Pluvial. But it is also possible that sporadic heavy rains along the Nile may have lasted as late as 2350 BCE. Even during historical times wetter conditions and sporadic unusually high Nile inundations have been recorded.

However, Nile flooding as a cause for the Sphinx’s erosion—rather than ordinary rain erosion—does not stand up to scrutiny, according to Schoch. In the walls of the Sphinx enclosure, the lowest rocks, which are generally softer than the layers higher on the wall, jut out more than the rocks at the very top.
A Prehistoric Sphinx

If sudden flooding of the area by Nile waters was a significant cause of erosion, then the soft rocks at the bottom of the walls would have eroded farther back. As floodwaters rose they would have undercut the uppermost rocks. But, this is not what is exhibited in the Sphinx enclosure. The topmost layers of rock, which are harder, are receded farther than any other layer.

According to Schoch, it is clearly rain that is responsible for the erosional features on the Sphinx and Sphinx enclosure: “This is a classic, textbook example of what happens to a limestone wall when you have rains beating down on it for thousands of years.”

In 1999, in an attempt to reconcile the geological features of the Giza Plateau and provide a more palatable date for Egyptologists came from British geologist Colin Reader. Reader reviews the geology, geomorphology, and surface hydrology of the Giza Plateau and puts forth a revised sequence of development of those structures. He also considers the development of ancient Egyptian stone masonry, and in the end, reconciles the geological and archaeological evidence placing the carving of the Sphinx within the context of the first or second dynasty (2920–2650 BCE). Although Reader agrees with Schoch that water was a prominent force of weathering, the quarrying of the Sphinx enclosure, the carving of the Sphinx, and the construction of the Sphinx temple occurred before Khafre’s fourth dynasty projects, around 3000 BCE. The relative weakness of the Upper Mokattam limestone, from which the Sphinx was carved, along with the prevailing climatic conditions, makes it conceivable in his opinion that intense weathering could have developed within a shorter period of time.

Although arid conditions were predominant during the early dynasties, conditions were generally not as dry as today’s. With less arid conditions, chemical weathering likely resulted in the leaching of soluble salts from the exposed rock. As this soluble component was removed from the rocks, the potential for further chemical weathering was reduced.

The exposed rock that was not subjected to rainfall runoff weathered as a result of leaching, the process by which soluble materials in the soil or rock (salts, nutrients, other chemicals or contaminants) are washed into a lower layer or are dissolved and carried away by water. However, in the western area of the Sphinx enclosure, heavy seasonal rainfall runoff removed much of the weathered limestone, exposing comparatively un-weathered rock. Given the soluble component of newly exposed rocks, this type of erosion likely promoted a renewed phase of chemical weathering and leaching, which accelerated the deterioration process. Reader believes that these particularly aggressive and repetitive weathering conditions in the western area of the enclosure could have developed over a relatively short time period, in geologic terms.

In essence, Reader suggests that sporadic but intense thunderstorms were responsible for the erosion Sphinx. As heavy rains were unable to soak into the sand a sheet of water formed on the surface and cascaded down slope of the plateau and over the southern and western enclosure walls.

Sphinx Erosion - A Comparative Analysis

All land surfaces can be considered hill slopes even if they have no incline (a flat surface has a “slope” of zero degrees). In most cases, the erosion of a slope can be considered a system that links together weathering (the breakdown of rock), hill slope processes (such as mass wasting of solid rock and the movement of loose rock and soil downslope by either gravity or running water), and erosion, which typically occurs from rivers in valley bottoms.

Rainfall is the source of water erosion. Whether the water infiltrates the ground depends on rainfall intensity and the rate of infiltration allowed by surface conditions. Where rainfall intensity exceeds the infiltration capacity of the soil, shallow water flows over the land. This “saturation” overflow occurs mainly at the base of slopes and in concavities. The ground becomes saturated during prolonged rain by a combination of infiltration, the downslope flow within the soil, and groundwater flow. Once the soil is saturated, its infiltration capacity is zero, so any additional rain cannot soak in. When this occurs, it is stored on the surface or becomes overland flow.
Water that infiltrates the ground becomes either soil moisture or groundwater. Just above the water table there is the capillary fringe, where water is drawn up from the water table by capillary action, referred to as “discontinuous saturation.” Typically, the water table is not level and follows the shape of the surface—higher under hills, lower in valleys. Because of this, both soil moisture and groundwater can flow from high to lower elevations, although these flows are usually very slow. A typical flow rate for clean sand is around ten meters a day where the main contribution of slope erosion is the removal of material by water.

Water flowing overland, whether in a channel or moving across an open plain, transports sediment down a slope. This results in sheet wash, rills, and gullies. Sheet wash is, as the name suggests, a sheet of water flowing across a surface. It is the uniform removal of soil without the development of visible water channels, and is the least apparent of erosion types. Rills occur when sheet wash concentrates into many small but conspicuous channels. Gullies occur when sheet wash and/or rills concentrate into larger flows. Sheet wash is aided by rain-splash erosion—in which raindrops detach particles from the surface—and is most effective in dry regions that lack protective vegetation. In all cases, the movement of soil and rock particles by flowing water is erosion.

Where infiltration is low and rainfall intensity high significant, overland flowing water occurs. Infiltration is affected greatly by the presence of vegetation, which promotes water absorption by maintaining an open soil structure. For this reason, Hortonian flows (flows that do not drain into channels or gullies) occur mainly in arid regions with poor vegetation cover. These areas are subject to rare but intense thunderstorms, such as in the southwestern United States, as well as in areas of northern Africa. In these places, intense rain may last only a few minutes, but significant erosion can occur.

More than twenty-five years of geological and archaeological investigations in the extremely arid regions of southwestern Egypt and northwestern Sudan demonstrate that less arid conditions existed in these areas beginning around 8000 BCE. At that time, the eastern Sahara changed from an extremely arid, lifeless desert to a semiarid savanna that attracted plants and animals. This life-supporting climate continued and then gradually deteriorated. Around the third millennium BCE the current episode of extreme aridity ensued. This prehistoric wet period can further be broken down into a sequence of three phases. The first existed from 8000 to 6200 BCE; the second, 6100 to 5900 BCE; and a third, from 5700 to 2600 BCE.

Reader believes that the rains were heavy enough during this last wet phase to account for the visible erosion. Furthermore, Reader also believes that rainfall runoff and sheet wash, and not direct rainfall, were the source of the water erosion on the Sphinx’s western enclosure wall. Thus, any exposed rock would suffer from runoff following the rains and would be heavily eroded. Once the rock from the west of the Sphinx was quarried during the fourth dynasty, the potential for runoff erosion of the enclosure walls ended. So the Sphinx was carved, at least, before 2500 BCE.

The walls of the Sphinx enclosure exhibit erosion to a depth of three feet and at its greatest point to a depth of over six and a half feet. So, the pertinent question is, how long did it take for this erosion to occur?

According to geology textbooks, the lowering of ground through water erosion is generally a slow process. The rate at which rock erodes depends upon the type of rock. In general, igneous and metamorphic rock erodes 0.5–7.0 mm every 1,000 years; sandstone, 16–34 mm every 1,000 years; and limestone, 22–100 mm every 1,000 years.

<table>
<thead>
<tr>
<th>Type</th>
<th>Per 1,000 years</th>
<th>Per 10,000 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>igneous/metamorphic</td>
<td>0.002–0.28</td>
<td>.02–2.8</td>
</tr>
<tr>
<td>sandstone</td>
<td>0.24–1.34</td>
<td>2.4–13.4</td>
</tr>
<tr>
<td>limestone</td>
<td>0.87–3.94</td>
<td>8.7–39.4</td>
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</tbody>
</table>
Although there is no available data for erosion rates on the Giza plateau, geologists have studied the erosion of rock formations around the world. One of the most well-known erosional features in North America is the Grand Canyon. Geologists have calculated that the age of the canyon is six million years old. Since it is six thousand feet deep at its deepest point, this means that every one million years the canyon rock erodes a thousand feet. In other words, every year for the past six million years the Colorado River has eroded the underlying bedrock 0.001 foot, which is 0.012 inch per year. If we applied this rate of erosion to the Sphinx’s enclosure walls, it would take three thousand years to erode three feet and six thousand years to erode six. However, one would expect the steady force of the Colorado River to erode rock at a much faster rate than either rainfall or sheet wash from rainstorms.

All running water gathers and transports particles of soil and fragments of rock. Every stream carries material, received from its tributaries or from its own banks, suspended or rolling along its bottom. These particles strike against the bedrock of the stream’s channel and literally grind away the surface; they eventually settle out along the channel or get transported out to sea. In this way, the Mississippi River has been reducing the underlying bedrock at the rate of one foot every nine thousand years, which is .0013 inch per year. If the Sphinx’s enclosure walls eroded at the same rate as the Mississippi River’s foundations, it would take twenty-eight thousand years for three feet of erosion and fifty-six thousand years for six feet. (Of course, a large-volume river has a significantly greater erosional force than does periodic rain or sheet wash, so this is not a comparison of like phenomena.)

In studying the Wutach catchment (a geographical area where water collects) in the southeastern region of Germany’s Black Forest, European geologists Philippe Morel, Friedhelm von Blackenburg, Mirjam Schaller, Matthias Hinderer, and Peter Kubik calculated the rate of erosion for sandstone at 9–14 mm every 1,000 years; granite, 27–37 mm every 1,000 years; and limestone 70–90 mm (which is 23/4–31/2 inches) every 1,000 years. Using three inches as an average rate for limestone erosion every 1,000 years (.003 inch per year) it would take twelve thousand years for the Sphinx enclosure to erode three feet and twenty-four thousand for six feet.

According to the geologists John Stone and Paulo Vasconcelos, erosion rates in Australia vary with climate and the character of the rock formation, as well as the local landscape. In the highlands of Papua New Guinea, chlorine-36 measurements on calcite from limestone outcrops around the continent indicate that erosion rates from rainfall vary from one meter every million years, in the arid interior, to 150 meters every million years. That’s a range of one millimeter (0.03937 inch) to 150 millimeters (six inches) every thousand years. According to these rates, it would take anywhere between six thousand and one million years to erode the Sphinx enclosure walls three feet and between twelve thousand and two million years to erode six feet.

More importantly, Stone and Vasconcelos concluded that limestone erosion rates are well correlated with average annual rainfall at values close to those predicted by the equilibrium solubility of calcite. In other words, the more it rains, the greater the rate of erosion in limestone rock.

Geologists Ari Matmon, Ezra Zilberman, and Yehouda Enzel, in their study of tectonic activity in the Galilee region of Israel, were able to provide the first estimated rates of landscape-forming processes. According to their study, limestone erosion occurred at a rate of approximately 29 meters every million years, which is 0.029 millimeter (0.00114 inch) per year. At this rate, it would take the Sphinx enclosure wall 32,000 years to erode three feet and 64,000 years to erode six feet.

One instance where rock rapidly erodes is at Niagara Falls. According to geologists, the falls have receded 11.4 kilometers in 12,400 years, a very fast average rate of nearly one meter per year. However, the rate of erosion has decreased recently because of the erosion-resistant limestone caprock the falls flow over. This limestone layer begins approximately one-half kilometer north of Rainbow Bridge. Still, as the falls continue to erode southward, the erosion rate will, again, increase when it reaches another soft layer of rock near Navy Island.
TABLE 2.2 EROSION RATES PER 1,000 YEARS (in inches) FOR VARIOUS GEOGRAPHIC AREAS

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galilee</td>
<td>–</td>
<td>–</td>
<td>0.001</td>
</tr>
<tr>
<td>Mississippi</td>
<td>–</td>
<td>–</td>
<td>1.3</td>
</tr>
<tr>
<td>Wutach</td>
<td>2.75</td>
<td>3.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Australia</td>
<td>0.04</td>
<td>6.0</td>
<td>3.02</td>
</tr>
<tr>
<td>Grand Canyon</td>
<td>–</td>
<td>–</td>
<td>12.0</td>
</tr>
<tr>
<td>Giza (Schoch)</td>
<td>16</td>
<td>29</td>
<td>22.5</td>
</tr>
<tr>
<td>Giza (traditional)</td>
<td>–</td>
<td>–</td>
<td>72.0</td>
</tr>
<tr>
<td>Niagara (American Falls)</td>
<td>–</td>
<td>–</td>
<td>250.0</td>
</tr>
</tbody>
</table>

Niagara Falls is actually composed of three falls: the American Falls, between Prospect Point and Luna Island; the Bridal Veil Falls, between Luna Island and Goat Island; and the Horseshoe (Canadian) Falls, between Goat Island and Table Rock. Rock characteristics vary among these different areas. In general, the natural bedrock at the falls is composed of soft shale and limestone. Over the years, the continual flow of water has caused large sections of bedrock to break away. The soft shale erodes faster than limestone, undermining its stability. Today, the American Falls has no regular mode of collapse. So, the present amount of water flowing over the American Falls is insufficient to erode the dolostone talus (slope formed by rock debris) at the base of the falls. (Dolostone is similar to limestone, but is composed mostly of the mineral dolomite.) The current rate of erosion at the American Falls is estimated at one-quarter inch per year—250 inches (twenty feet) every thousand years. Furthermore, the water flow, which is regulated at a minimum level of 10 percent of the estimated 100,000 cubic feet per second during the summer (half that during winter), is insufficient to cause major erosion.

As various as they may be, environmental influences will always play a role in physical and chemical weathering rates. Records show physical weathering is most pronounced in cool, humid climates, because of water's characteristic to freeze and thaw. On the other hand, rates for chemical weathering are driven by temperature and water supply.

As a result, chemical weathering is most pronounced in hot, humid regions. Since water is a large factor in chemical weathering, as well as erosion when particles are moved away, weathering rates and erosion are slowest in arid environments, which is precisely what Stone and Vasconcelos found in their Australian study. It is also why rivers produce some of the greatest erosion rates.

There is a well-documented correlation of annual rainfall and temperature with weathering and erosion, and this correlation serves as a principle for understanding what types of erosion can be expected in various climates. In regions where rainfall and temperature are both relatively high—for example, a tropical rainforest—chemical weathering (the breakdown of rocks resulting from chemical reactions between the minerals in the rocks and substances in the environment such as water and oxygen) is strongest and a predominant feature of exposed rock. At the other extreme, where both temperature and rainfall are relatively low, mechanical weathering is predominant and may be slight to moderate depending on the rainfall.

Mechanical weathering is the process by which frost action, salt-crystal growth, absorption of water, and other physical processes break down a rock to fragments, involving no chemical change. Temperate latitudes in North America and Europe are good examples of regions that experience prominent mechanical weathering, although in some areas annual rainfall may exceed fifty inches.

In extremely arid areas, one would expect to find only very slight weathering of any kind. What would be expected is erosion from airborne particles by way of windstorms. North Africa and the Middle East are good examples of this type of erosion, and the desert region that stretches from northern Mexico into the southwestern United States.
Geologists seldom try generalizing about rates of weathering and erosion because weathering and erosion vary in each climate, and perhaps in microclimates within each climate. There is also the type of rock and terrain to consider. However, for a given area, one would expect a certain range of weathering and erosion that would be consistent with the model presented in figure 2.9. Substantial deviations from those ranges suggest that the climate was different in the past.

The geologic principles of weathering and erosion can explain the wide range of erosion rates in the Australian study. In Australia’s interior, it is hot and dry with very little weathering. But in New Guinea, where monsoons occur between December and March and again between May and October, weathering occurs at a much greater rate.

The discovery of erosion rates outside a climate’s expected erosion range poses a problem that requires an explanation. The greater the deviation, the more difficult it is to explain. At some point the deviation becomes so large that one is forced to reconsider the assumed timeline to bring it into accordance with known geologic principles.

Although erosion rates vary from region to region based on climate, rock type, and terrain, geologic evidence indicates that limestone rock erodes at a very slow rate unless subject to the force of a mighty river, such as the Niagara. The amount of water flow (a function of rainfall and natural drainage systems) and the hardness of the rock are the two most important factors determining the rate of erosion.

As far as the erosion on the Sphinx and its enclosure, Egypt experienced three wet periods between 8000 and 2600 BCE. Yet the rainfall during these wet periods averaged just enough—twelve to twenty-four inches annually—to turn the climate from arid to semiarid, resulting in a landscape similar to the southwest region of North America: dry, but wet enough to allow plant and animal life to flourish.
I argue that we can use geologists’ knowledge of erosion to answer the question of the Sphinx’s age. As would be expected, the softer limestone has eroded to a greater degree than the harder layers. However, the hard layers, especially at the top of the west enclosure wall, also show significant weathering. To explain this, Schoch postulates that the erosion occurred over many thousands of years, specifically from rainfall. Reader argues that it occurred relatively quickly, during Egypt’s early-dynastic times (2920–2650 BCE) because of sporadic and severe thunderstorms that resulted in sheet wash rolling across the plain and over the edge of the enclosure.

Given the known climate of Egypt for the past ten thousand years, it is highly probable the temperature and rainfall characteristics of the area fall into the region, noted in figure 2.9, where “very slight weathering of any kind” would be expected. The average rate of limestone erosion, drawn from table 2.2 (excluding the Giza plateau and Niagara Falls), is three and a half inches every thousand years. Using this average, it would take ten thousand years for the Sphinx’s western enclosure wall to erode three feet and twenty thousand years for it to erode six feet. Although it would be incorrect to assume that this is actually the case, these figures support Schoch’s conclusion that rock weathers slowly, and that the Great Sphinx of Egypt eroded in this manner.

If Reader’s is correct in his analysis that the erosion occurred at a faster pace how many thunderstorms would be necessary to cause the observed degradation? What amount of water, and during what length of time, would be needed to flow down the plain and over the top of the enclosure wall? Although Giza did experience rainfall during early and predynastic times, the climatic evidence suggests that these rainy periods were moderate and not long-lived.

The alternative to either Schoch’s or Reader’s theory is that the conventional view is correct, and the observed erosion occurred during the fourth and fifth dynasties, between about 2500 and 2350 BCE, a period of 150 years. This calls for an erosion rate of one-quarter inch per year—nearly identical to the current erosion rate of Niagara’s American Falls. If this is true, then the real mystery is not Schoch’s or Reader’s geological analysis of the Sphinx and the Giza plateau, but the unidentified forces that caused the limestone rock of the Sphinx enclosure to break down so rapidly.

All the evidence strongly suggests a prehistoric Sphinx.
Painting a picture of the past, particularly the ancient past, is more speculation than it is fact. Usually there is never enough evidence to state anything with total confidence unless the evidence is conclusive and irrefutable. As a result, theories abound.

The accepted theory today is that dynastic Egypt grew out of climate change. As the North African climate increasingly became more arid pastoral tribes, seeking a new and reliable source of water migrated to the Nile Valley. Within a few hundred years, or possibly a thousand years, the population reached a threshold where civil organization became a necessity for the common good. At first, two civilizations developed. One located in the south, and the other, the north. Around 3000 BCE these two civilizations were united under a single ruler names Narmer or Menes. Within the next five hundred years the burgeoning Egyptian civilization developed techniques to build colossal structures and statues as far south as Thebes and as far north as Tanis. All of which were religious oriented and deified the king as a living god.

Because there is never enough evidence to know when a stone temple was built or what the intention was of those who ordered an inscription carved, reconstructing an ancient civilization requires assumptions. Over time, through successive refinements the history of this reconstructed civilization becomes a body of knowledge and eventually an established model with its own set of concepts, values, and practices. In effect, the theory becomes a paradigm, a particular way of viewing history. As a paradigm, the theory is effectively viewed as fact.

The unfortunate part of this process is that assumptions can be incorrect even though, at the time they were conceived, they were made with prudence. Another unfortunate part of this process is that once a theory has been established as a paradigm its proponents become its guardians and groom their successors to continue the tradition. Accordingly, any new evidence that calls for a significant modification of the paradigm or evidence that contradicts it outright is often viewed in an air of disgrace.

**Aspects of Evidence**

Artifacts of an organic nature can be carbon dated, but structures of stone cannot. Inscriptions and documents tell of people, places, and events but also philosophy and tools can be classified by composition, function, and quality of craftsmanship. But how do we know with any certainty that the piece of coal that was carbon dated means that the stone bench it was discovered next to is the same age? How do we know with certainty that an inscription is referring to a person or place or is religious or philosophical? How do we know what tools were used when and for what purpose?

We don’t, really, so assumptions have to be made. In the case of history the base assumption is linear evolution. Thus, no culture with any advanced technical sophistication existed prior to modern civilization. As a result, orthodox Egyptologist are opposed to the idea that the ancient Egyptians used anything other than copper chisels, and blunt-blade copper saws to quarry, cut, and shape granite. Nevertheless, while visiting Egypt it is difficult not to sense that the civilization, who continually built big and with granite, was an anachronism five thousand years ago as much as it is today.

For the last one hundred and fifty years researchers, academic and independent, have been pouring over various engineering and construction methods in order to explain how the pyramids were built, some of which show significant merit. Special interests groups have tried to move and raise a few courses of one-ton stone blocks only to end up acknowledging the futility of their efforts. Still, I suspect that if enough determined men put their minds to it they could build a pyramid that resembles one of
the stone mountains on the Giza Plateau. But this is not really the point. The point is that building on such a huge scale, and with the hardest rock on the planet, is not a simple task regardless of the time period in question, particularly so when the tool chest can only contain a few copper chisels and a wooden mallet. How many chisels would it take: a hundred thousand, a million? The point is evidence, and there is no evidence that an army of men ever worked on the Giza Plateau hewing limestone and granite with copper implements. In fact, there is no tool evidence of any kind. The only evidence that exists is the final product, the structures themselves, or more precisely what is left of the structures. It is this ‘negative evidence’ that requires the need for assumptions, which, in the past, created a need for written records to shed light on the subject.

Unfortunately, written records may not always exist, which happens to be the case with ancient Egypt. Yet, today’s interpretation and understanding of the civilization who built the pyramids and their associated structures, hinges on the preservation of written records. How this seemingly contradictory statement works is that a third century Egyptian priest under the reign of Ptolemy II was supposed to have written a detailed history of ancient Egypt, and from his works the chronology of Egypt was established. His name was Manetho. But his ‘detailed history’ is misleading for two reasons. First, Manetho’s text does not exist. All that exists are quotations and synopses by later historians of Roman times. Second, the copies of Manetho’s text that have survived do not always agree. In some instances the names and dates are garbled “most horribly.” How much of the error is because of the copier and how much is from Manetho in unknown, and will likely never be known. Nonetheless, Manetho’s Notes on Egypt (the actual title) is the basis for Egyptian history when there is nothing to contradict him. He is responsible for the creation of dynasties, the separation of houses or families that ruled Egypt.

Aside from Manetho, there is really nothing else to go by. So why use it?

Because, according to former Egyptologist Barbara Mertz, “Manetho’s concept has been used for so long that it would be inconvenient to discard it.” Even so, Manetho does not describe how the pyramids were built, or who built them, or at what time they were built.

Another ancient historian, Herodotus, did describe a machine that supposedly was used to lift large blocks of stone, but his lifetime is so far removed from the actual event (more than two thousand years according to accepted chronology) no other useful information apparently survived for him to comment on. Even so, a single lever-based machine, possibly a real piece of technology from the pyramid builders handed down the many generations, does not account for the quarrying, roughing, and finishing more than two million blocks. Neither does it explain the design, internally or externally. So we are left with the final product as the sole evidence.

There are four aspects of the evidence that must be addressed in a logical and rational way. First, the scale of construction is colossal as well as the pieces to be assembled. Second, the materials used, limestone and granite, are some of the most difficult building materials to handle even by today’s standards. Third, the manner in which the structures were built is extraordinarily precise, which means the builders had measuring instruments to ensure that the cutting and assembly was, in fact, precise. With these three known facts the assumption must be that machine tools were used in the construction process. Four, and most important, machine tool marks exist on a number of artifacts that cannot be explained by the use of simple tools.

These four aspects of the evidence not only suggest that the tools of the pyramid builders were sufficiently sophisticated in order to quarry, cut, shape, transport, and place enormous amounts of granite and limestone, but that the civilization which constructed the pyramids must have had a long period of technical development in order to carry out such massive projects. This, of course, brings up the problem of ‘where are the machines?’ For whatever reason, the answer is that they have not survived. Yet despite their non-existence, we are forced to assume by the objective analysis of the evidence that these machine tools did in fact exist since machining techniques best explain the evidence.
Petrie and Precision

Sir William Flinders Petrie is probably the most famous of all Egyptologists, a result of his meticulous methods of excavation, measurement, and documentation. Well-liked by those who worked with him, his legacy remained in Egypt for some time, so much so that the loyalty of the men he trained, from a village called Quft, manned and directed expeditions for many years. During the late nineteenth century, Petrie was the first man to publish a detailed description of the pyramids and temples, and other associated artifacts discovered at Giza. Even today Petrie’s *Pyramids and Temples of Gizeh*, written in 1883, is a highly coveted book.

Petrie was also the first to recognize and that pottery was valuable to the archeologist, particularly as a means of dating artifacts found in excavations. There is no real value to pottery, and as a result, researchers discarded broken vessels. Likewise, since there was also no intrinsic value to pottery, treasure hunters completely ignored almost everything ceramic. They were after gold and silver. Thus, pottery and potsherds almost always remained in the original place where it had been discarded. For Petrie, this was one of the most useful types of evidence and in conjunction with cemetery excavations allowed him to date the development of Egyptian culture from earliest times. Pottery, however, was not all Petrie had noticed.

By paying close attention to detail, Petrie was the first archeologist to recognize that the ancient Egyptians used ingenious techniques for cutting and shaping stone, what he refers to as “mechanical methods.” Petrie was convinced that he had solved the problem of the “methods employed” in order to cut and shape stone. However, just as the situation is today he admitted there was no proof that the tools existed or how they were used. Still, from the artifacts he had discovered and closely inspected, according to Petrie, whoever built the pyramid and temples on Giza were using tools with cutting points far harder than the granite, diorite, and basalt used to construct the pyramids.

Although Petrie, or anyone else at that time, was unable to determine what substances were used in the cutting point, logically, he assumed that the substance had to be beryl, topaz, chrysoberyl, corundum, sapphire, or diamond. Only these materials are hard enough to cut granite. And, of these five types of material Petrie favored the un-crystallized corundum, although the quality of work seemed to indicate diamonds. Diamonds, however, are not a common stone of Egypt.

One way to cut hard stone was to use ‘powder sticks’ of corundum which were applied to implements made of copper or wood. By scraping the stone with the treated implements, the stone gradually wears away. According to Petrie, this may be the case with softer stone such as alabaster, but not with harder stone. Hard stone requires jewel tipped implements.

The evidence is clear on this point, Petrie claims. Inscriptions on diorite bowls from the fourth dynasty discovered at Giza were not scraped or ground. Rather, whatever removed the rock to form the inscription easily ploughed through the diorite. Some of the inscribed lines are only 1/150 inch wide and two parallel lines were carved with only 1/30 inch between them. Thus, Petrie concluded that the tool to accomplish this had to be tough enough not to splinter yet had an edge so fine must it have been only 1/200 of an inch wide. He found the same type of tool evidence in saw marks made in diorite; grooves as deep as 1/100 inch which are regular and uniform in depth. The same is true for a granite core (No. 7) broken from a hole made from a tube drill. Grooves around this core form a regular spiral and are perfectly symmetrical with the axis of the core. For Petrie, this could only be accomplished through tools with fixed jewel points serving as the cutting surface of the drill tube.

Petrie found numerous examples of tube-drilling and described them in detail. In particular was the granite box which was hollowed out by cutting rows of holes made by a tube drill, and then breaking out the cores and intermediate pieces. In one box, two drill-holes were run too deeply into the sides of the box. At El Bersheh a larger example exists where a platform of limestone rock was reduced with tube drills measuring about eighteen inches diameter.
Examples also exist for the use of straight saws, some of which were more than eight feet in length and varied from .03 to .2 inches thick. In the granite box of the Great Pyramid the saw was pushed too deep into the material, twice over, and backed out again. A piece of syenite from Memphis, possibly waste material from a statue, exhibits cuts on four sides and a cut across its top by the breadth of the saw. Petrie also noticed marks on the basalt paving stones on the east side of the Great Pyramid. On one block the saw apparently ran askew so it was abandoned. Another block shows regular and well-defined lines where the saw began to cut. And yet another was sawn on both sides, and nearly cut into two pieces.\textsuperscript{10}

One of the more unusual pieces, a piece of diorite, bears the regular grooves of circular arcs, parallel to each other. Although faint as a result of being polished out by crossed grinding, they are still visible. For Petrie, the only reasonable explanation for this piece is that it was produced by a circular saw.\textsuperscript{11}

There is also evidence that items were turned on a lathe. Numerous Old Kingdom diorite bowls and vases display great technical skill. According to Petrie, “the lathe appears to have been as familiar an instrument in the fourth dynasty, as it is in modern workshops.”\textsuperscript{12} One piece in particular, a bowl, clearly displays two surfaces where it had been knocked off its center, re-centered, and cut again. The two surfaces on the bottom of the bowl meet in a cusp. For Petrie, “such an appearance could not be produced by any grinding or rubbing process which pressed on the surface.”\textsuperscript{13} Another bowl is spherical, and therefore must have been cut by a tool sweeping an arc from a fixed point while the bowl rotated. Here the machinist re-centered the tool near the mouth of the bowl to create a lip. According to Petrie, this bowl was certainly not created by hand. The bowl is exact in its circularity even at the cusp where
the lip and the body of the bowl meet. "It is a clear proof of the rigidly mechanical method of striking the curves."\(^{14}\)

The mysterious part of Petrie’s analysis is that for such tools to work properly, and plough through granite and other hard stone, intense pressure is required. According to Petrie calculations, the pressure required is at least two thousand pounds. For example, in Petrie’s granite core No. 7 the tool sank one tenth of an inch for every six inches of circumference, which is an astonishing rate for granite. Today, hydraulics applies the pressure needed to cut such hard material.\(^{15}\)

Petrie also testifies to the use of testing-planes in working surfaces, drafted diagonals, the character of fine joints, and the accuracy of leveling. All of which are examples of experienced and skilled workers. One of most astonishing feats is the descending passageway in the Great Pyramid. The 350-foot, $3^{1/2}$-foot square passageway descends a hundred feet into the bedrock. Yet, over the length of the tunnel in varies only by $\frac{1}{4}$ inch. Despite such incredible perfection and Petrie’s observation of that perfection, he acquiesced to the idea that high precision was accomplished solely with the use of hand tools. He also believed that the pyramids were designed as tombs.

I am not sure how a saw or drill made from copper would fare under a stone weighing two thousand pounds, or even how the workers would turn the drill. In a world driven by the burgeoning dogma of Darwinism, perhaps it was better for Petrie to suspend construction logic a little bit rather than join the ranks of the ‘pyramidists.’

It has been said that the pyramids are negative evidence or indirect evidence since no machines have ever been found that may have been used to construct the pyramids. Personally, I don’t understand ‘negative evidence’ or ‘indirect evidence.’ These are adjectives applied to the word ‘evidence’ in an attempt to persuade an audience that the evidence is not really evidence while at the same time being evidence. For example, the pyramids themselves exhibit such skill in quarrying, dressing, and placing stone blocks, as well as the precise construction of its passageways, that their existence is the physical proof that machine tools also existed even though no machine tools have ever been discovered. In other words, in order to accept the theory that the pyramids were built using only the simplest of tools, and by hand, the known principles and practices of construction have to be suspended.

**Dunn and Precision**

Petrie was not only researcher to notice the fine cutting and crafting of granite. A hundred years later expert machinist and precision manufacturing executive Christopher Dunn reopened the case for precision machining Petrie created. In 1995, armed with machinist’s measuring tools Dunn traveled to Egypt to gauge just how flat some artifacts were he had noticed on previous trips. Thus, with a precision straight edge he determined that a higher order of precision existed in many artifacts that have never before been described, such as the granite box in the bedrock chamber of the middle pyramid. In measuring the inside surfaces of the black granite box Dunn found them to be perfectly flat.

Four years later, Dunn double-checking his work. By sliding the straight edge along the interior wall of the granite box, while shining a flashlight behind it, any imperfections in the surface would show up by allowing light to pass underneath the ruler. Thus, the precision of its interior surface could be demonstrated. It was precisely flat. Dunn also slid his precision square along the top of the parallel and it fit perfectly on the adjacent surface. The other corners were in the same condition, perfectly square, although one corner did reveal a small gap of about .001 of an inch. As for the corner radius, at one end of the box one inside corner measured $3/32$ inch at the top and $7/16$ inch at the bottom.\(^{16}\)
For the layman, square corners and flat surfaces may seem like nothing to get excited over. That is because today’s manufacturing industry has perfected the production process, so we take it for granted. Have you ever tried to make a block of wood perfectly flat and square with a handheld planer to 0.001 of an inch? It’s next to impossible. Yet, however built these stone boxes did it with granite.

In order to produce perfectly square and flat objects a society has to develop systems of production as well as methods of measurement in order to ensure that the item produced is high quality. This takes many generations of specialization and the development of tools and instruments. It also requires an educational system. As such, the requirements for producing the conditions in the granite box go well beyond the capabilities of simple tools and methods. Even today, it is extremely difficult to achieve perfectly flat surfaces and square corners in granite. It requires machines.

For Dunn, “artifacts such as these fly in the face of any previous explanations of the ancient Egyptians stone cutting methods.” The more interesting question is not so much how boxes, like the one in the middle pyramid’s chamber, were manufactured, but why their builders required such precision and accuracy.

Obviously, precision was required.

**Dunn and the Problem of the Unfinished Obelisk**

Without any formal analysis by manufacturing experts what tools and labor required to work with granite has always been an assumption. However, an estimate of what would be required to manufacture such large granite artifacts can be calculated; for example, Aswan’s Unfinished Obelisk.
The Unfinished Obelisk is a massive 1100-ton (or more) square column still lying in granite bedrock, in an Aswan quarry. It offers compelling evidence to the level of technology its builders employed. Not so much by what methods was used in its creation but evidence of what methods were not used.

Current thinking is that dolerite (pounding) balls were used to chip away fragments of granite by crews of workers. While in Egypt Dunn tested this ‘pounding’ technique and found that it did remove material, but was very inefficient. According to Dunn, there is a trick to pounding that has to be mastered. When the pounding ball is thrust against the granite it bounces back and by catching it as it bounces a rhythm can be established to minimize the energy expended by the worker. Doing this on a consistent basis takes practice. The key to this pounding technique is to let gravity do the work. Ideally such a technique works, but if the pounding ball is irregular in shape, the bounce of the ball becomes random, like a kicked football making a right-angle turn as it hits the ground nose first. As everyone who has played football knows, catching the ball after it has bounced requires more luck than anything else.

With such a crude and inefficient method of removing granite, it could be argued that the ancient Egyptians were experts in the creation of perfectly spherical pounding balls and their use; therefore, they would have been able to removed granite to form an obelisk in a reasonable amount of time. However convincing this argument sounds there are significant problems.

One problem is that there are constraints, physical limitations, to a crew of workers pounding on an obelisk still in its quarry. According to manufacturing engineers, constraints exist particularly in the proper use of tools. They also exist as limits of human endurance, such as number of hours a man could work in 110 degree heat bashing a heavy ball against granite; or the number of men that can crowd into the available workspace. There is also the problem of generating enough force with the ball in order to remove stone.

For Dunn, genius and inspiration would have been better served in designing more efficient tools to accomplish such a task. The nine-foot deep troughs, and bore holes even deeper, suggest a very different approach to creating an obelisk. Common sense dictates that people who only knew of such an inefficient process of material removal would have never attempted such a project.

According to Dunn, the use of dolerite pounding balls cannot have been the method the creators of the obelisk used to cut and shape granite, regardless of practicalities. Despite the evidence, capable scholars conclude that only simple tools could have been used. Thus, the principle of Occam’s razor is boldly used. Where all things being equal, the simplest solution is likely the correct one is raved with glee in dismissing the idea that sophisticated machining and manufacturing existed in ancient Egypt. Thus, since surviving tools or machines are not known to exist to corroborate the evidence of powered tools, any arguments put forth other than the accepted dogma are dismissed as ‘lunatic fringe’ or “pyramidiocy.” Tools that have minimal capability and produce inferior results must have been used regardless of construction scale or material. Ironically, for Dunn, when taking into account modern manufacturing methods, the conventional theory of copper chisels and stone or wood hammers is the wackiest theory of all.

Yet this is what all children are taught in school and what audiences see on television. Copper chisels, wooden mallets, and stone pounders along with a lot of muscle are the only things necessary to build an immense civilization in granite. However, the conclusion that dolerite pounders were used to quarry hard igneous rock and copper chisels to cut and shape the quarried rock has never been experimentally demonstrated to be true. Those who have tried have always failed in their attempt to explain the evidence.

Certainly ancient peoples used dolerite pounders to create objects. The evidence for this is unmistakable and can be seen at the Memphis and Cairo Museums. However, just because one artifact, a granite box for example, was made with pounders does not mean every granite box or a gigantic obelisk was also created with pounders.
The Stone at Abu Rawash

How long it took to create an obelisk was recorded by its builders and carved into the base of Hatshetsup’s obelisk at Karnak. Thus, a constraint is created by which explanations of constructions techniques must conform to or be discarded. Egyptologist Dieter Arnold explains:

…quarrying hard stones with stone tools was a difficult and time-consuming activity, but one that apparently did not create a real problem. We are told in the inscription on the base of the obelisk of Hatshetsup that quarrying and moving the pair of 30-meter [98-feet] high obelisks in front of Pylon V of Karnak took only seven months. 18
More than eighty years ago Reginald Engelbach stumbled across the 'the problem of the obelisk' and attempted to prove that dolerite pounders were indeed the tools used to create the obelisk. Using the constraints according to Hatshepsut's obelisk, Engelbach concluded that if men worked in continuous shifts, the obelisk could have been created within seven months, even if the Egyptians were not able to remove granite at a faster rate than Engelbach achieved.\textsuperscript{19} Engelbach recorded his technique and calculations in his book, \textit{The Problem of the Obelisks}: 

To return to the trench, it is interesting to speculate on the amount of time which was expended in making it. To ascertain this, I tried pounding for an hour by hand at various times on one of the quarters of a two-foot task and I found that I had reduced the level by about 5 millimetres (.2 inches) average. With practice I could perhaps have done more. Let us assume that the ancients could extract 8 millimetres (3.15 inches [sic]) per hour from a similar area; then the time taken to make the trench must be that taken to do the deepest part. In this obelisk the trench would have to be 165 inches to make it of square cross-section and we must allow at least 40 inches for undercutting (p. 49), making a total depth of trench required of 205 inches. Supposing that 3.15 inches were extracted from a quarter of each party’s task per hour, it will require \(4 \times 205 / (3.15 \times 12 \times 30)\) or 7.2 months of twelve hours per day. The undercutting would have taken at least as long again, even though it could be done from both sides at once.\textsuperscript{20}

According to Dunn, there were several serious errors with Engelbach’s experiment. One of the most incredible errors was his incorrect conversion of millimeters to inches, by an erroneous decimal
The Stone at Abu Rawash

placement. Instead of writing .315 inches (the actual conversion) in his equations he wrote 3.15 inches and effectively increased his granite removal rate by a factor of ten. His second error was ignoring his previous measurement for the width of the trench in which workers would stand to do their pounding. According to his measurements, the average width of the trench was two feet and six inches but in his calculations he used two feet. So, by reducing the width of the trench by six inches he reduced by 20% the amount of granite to be removed.

With corrected numbers, assuming Engelbach’s material removal rate is .315 inches per hour for a one-foot patch of granite, a removal rate of 45.36 cubic inches per hour (.315 x 12 x 12) would be achieved. But, and this is a big but, it is not possible to remove a square patch with a round ball. Thus, the number of cubic inches removed was certainly less. To restate Engelbach’s calculation correctly, assuming a rate of 45.36 cubic inches per hour, the time necessary to pound to the full depth of the trench would be equal to 4,067.46 hours (or 184,500/45.36 where 184,500 is derived by 30*30*205). With Engelbach’s twelve-hour day the task of excavating the trench would take 339 days of vigorous pounding.

However, the above calculation is only theoretical. There is also the problem of dust removal, a crucial factor since the dust cushions the pounding thereby reducing the removal rate of the granite. So, the granite dust has to be removed. Engelbach suggests that there was an assigned area for the dust to be brushed into. But such an area cannot contain a large amount of dust before the dust has to be removed from the trench, which, in turn, goes back to the problem of having enough space. Brushing away dust from the pounding takes time and requires work to stop which, of course, reduces the granite removal rate even more.

There is also an issue of practicality. How does a worker confined to a thirty-inch space in the trench pound granite with a dolerite ball without pounding his own toes or the toes of his co-workers! Even so, Engelbach increased his own rate of five millimeters (derived from experimentation) to eight millimeters based on an optimistic hunch.

Engelbach tried to explain how the obelisk was created but could not, and noted so:

I have spent hours trying to cut granite with iron, copper, and even dolerite chisels, and though granite can be cut—in a manner of speaking—with all of them I am convinced that the Egyptians used a much harder tool. There is still a great divergence of opinion on this subject, which is best left open until further evidence is forthcoming.\(^{21}\)

Today, a new expert had emerged in the arena of ancient tools and techniques. Denys Stocks, a technical consultant to Manchester University and an experimental archaeologist, has been able to demonstrate with simple materials and hard abrasives (such as quartz sand) that hard igneous rock can be worn away. Most recently in the NOVA funded Aswan project and OBELISK documentaries. As a result, Egyptologists have celebrated his work, which has propelled him to the title of world’s foremost authority on the techniques of the ancient stonemasons surpassing the opinions of Sir William Flinders Petrie (Pyramids and Temple of Gizeh, 1883) and Alfred Lucas (Ancient Egyptian Materials and Industries, 1962).\(^{22}\)

However, according to Dunn, it could be argued that Stocks’ work focuses on discovering ways to prove that simple tools and elbow grease was all that was needed to quarry, cut, and shape limestone and granite, while overlooking many of the nuances involved in working with stone. Primarily, the time it takes to accomplish the task of cutting granite. Nonetheless, his accomplishments have provided a wealth of data, and with Stock’s Aswan data Dunn has been able to perform a detailed analysis engineers use in estimating manufacturing costs for goods produced. What follows are Dunn’s calculations based on Stocks' research in estimating the time necessary to quarry a single granite obelisk, excluding the time required to pull the 440 ton obelisk from the quarry, finished it, and transport it to Karnak.

- 66 -
From viewing the unfinished obelisk at Aswan, it is clear that to create an obelisk a channel had to be cut around a section of granite rock and then undercut leaving pillars to support the weight. Since the surface of the channel surrounding the obelisk has scoop shaped quarry marks, Egyptologist Dieter Arnold believes that each worker was assigned an area of “75 centimeters wide and divided into working sections 60 centimeters long, the minimum space for a squatting or kneeling worker.” This allows for an area 2 foot by 2.5 foot wide for a worker to pound away with his dolerite ball.

With this method of construction it is easy for the inexperienced to assume that with sufficient labor the time it takes to ‘pound out’ an obelisk can be quickly accomplished. However, this is not necessarily the case. Constraints or workflow bottlenecks exist in almost every construction and manufacturing project. In the case of pounding out an obelisk a major constraint takes the form of the maximum number of workers that fit into the area where granite is being removed. Despite the fact that over a thousand workers, or even millions, are available to work only 104 of them can pound granite at any given time. Thus, the time it takes to carve out the block is based on the cubic mass of material to be removed divided by the material removal rate, where the mass of material is the width multiplied by the length multiplied by the depth.

According to Dunn’s estimates, for the unfinished obelisk the depth of the channel cut into the bedrock had to be nine feet and another two feet horizontally for the undercut. It should also be noted that the depth of the channel has to include cutting deep enough so that a worker can pound out a channel underneath the block in order to crawl through and chip away at the remaining rock holding the obelisk in place.

As for the work and workflow, Dunn assumes workers are pounding the granite using dolerite balls, and accepts Stocks’ assumption that the removal of granite is approximately thirty cubic centimeters per hour, and that work never ceases for the removal of waste or the replacement of pounders.

<table>
<thead>
<tr>
<th>Table 3.1: Christopher Dunn’s Constraint Analysis of the Channel</th>
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</thead>
<tbody>
<tr>
<td><strong>Feet</strong></td>
</tr>
<tr>
<td>Width of Patch</td>
</tr>
<tr>
<td>Length of Patch</td>
</tr>
<tr>
<td>Depth of Patch</td>
</tr>
<tr>
<td>Cubic Mass</td>
</tr>
<tr>
<td>Material Removal Rate/ Hour per Stocks (in cu.cm)</td>
</tr>
<tr>
<td>Number of Hours for one worker</td>
</tr>
<tr>
<td>Number of 10 hour days</td>
</tr>
<tr>
<td>Number of 329 day years</td>
</tr>
</tbody>
</table>

As for calculating the undercut that frees the obelisk from the bedrock, Dunn uses Stocks’ removal rate of five cubic centimeters per hour using a mallet and flint chisel. Although much slower than before, it is a reasonable assumption since the worker has to lie on his side chipping away at the rock without the aid of gravity to impact the surface. Although such a task challenges the imagination to believe that anyone other than an extraordinarily small person can effectively chisel a 2-feet by 2 1/2-feet tunnel underneath the granite, for the sake of argument Dunn bases his calculations on such an assumption. He also assumes that workers are on both sides of the granite chiseling towards each other.

Using these assumptions as described, and according to the physical constraints of the project, it takes sixteen years for the channel to be cut and another thirty-four years for the undercut to be made. Thus, the time required to quarry an obelisk is fifty years! According to Dunn, this is the minimum time requires since it is physically impossible to assign more workers to accomplish the task in less time, and the estimates exclude work stoppages for waste removal. Furthermore, granite removal at thirty cubic centimeters per hour must continue until a perfectly flat surface with sharp and square corners is
achieved, and that does not include the task of finishing the product, which, according to Dunn, would conservatively take another ten years using the tools the ancient Egyptians used according to Egyptologists.

Table 3.2: Dunn’s Constraint Analysis of the Undercut

<table>
<thead>
<tr>
<th></th>
<th>Feet</th>
<th>Inches</th>
<th>Meters</th>
<th>Centimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of Patch</td>
<td>2.46</td>
<td>29.53</td>
<td>7.50</td>
<td>75.00</td>
</tr>
<tr>
<td>Length of Patch</td>
<td>1.97</td>
<td>23.63</td>
<td>6.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Depth of Patch (half the width of the box)</td>
<td>4.00</td>
<td>48.04</td>
<td>12.20</td>
<td>122</td>
</tr>
<tr>
<td>Cubic Mass</td>
<td>19.40</td>
<td>33,514.60</td>
<td>549.00</td>
<td>549,000.00</td>
</tr>
<tr>
<td>Material Removal Rate/Hour (cu.cm)</td>
<td></td>
<td></td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Number of Hours for one worker</td>
<td></td>
<td></td>
<td></td>
<td>109,800.00</td>
</tr>
<tr>
<td>Number of Days (assuming 10 hour day)</td>
<td></td>
<td></td>
<td></td>
<td>10,980.00</td>
</tr>
<tr>
<td>Number of Years (assuming 320 day year)</td>
<td></td>
<td></td>
<td></td>
<td>34.31</td>
</tr>
</tbody>
</table>

Yet, according to its builders, Hatshepshut’s twin obelisks were quarried and raised into position in seven months.25 Conversely, according to the above analysis, in order to achieve such a feat the cutting rate would have to be increased at least by a factor of 37. This creates a serious problem. Tools capable of high efficiency cutting are not part of the archaeological record. For Dunn, this confirms that the assertions of Egyptologists are incorrect and that the builders of ancient Egypt were much more advanced than previously believed.

There is another, more subtle, problem. In a culture with the vision and genius to design and erect structures of hard stone, such as temples and pyramids, would they not also have the capability of fabricating tools to implement their grand vision for civilization?

The obvious answer is ‘yes.’ However, there are no known tools in the archaeological record that elicit the same awe in us as do the colossal statues and structures of this ancient civilization. No machine tools have been found to explain the precise contours of large granite ashlars found near the Valley Temple and the Middle Pyramid on the Giza Plateau, or the magnificent colossal granite statues of Ramses at Luxor. No metrology instruments have been uncovered to explain how ultra-flat surfaces, finished to optical precision over large surface areas, were created. Indeed, the tools that have been introduced to explain the grandiose stone working evidence are, in fact, incapable of doing the very work they are supposed to explain!

Given the facts and the evidence, it must be the case that there is a significant problem in our understanding of the past. Mainstream Egyptology maintains a logic that requires the tools used in the building process be present in the archeological record in order to explain the existence of these granite marvels. If, by chance, future archeologists 10,000 years from now uncovered a pickup truck next to an adjustable wrench and a screw driver, does this mean that these were the sole tools used in creating the truck? As the creators of the pickup truck we know better. Would the future archeologists? If the same type of associative logic was maintained over the next ten thousand years, they would not.

This modern day example highlights a failure in associative logic, and unfortunately, allows the theorist to make up anything for an explanation; all under the guise of ‘direct evidence.’ However, it must be realized when circumstantial evidence is explained only through vast leaps in logic the direct evidence is really no evidence at all. In fact, accepting such vast leaps in logic is a suspension of reality, for the physics associated with construction and manufacturing are the same today as they were five thousand years ago, or a million years ago for that matter.

As for the evidence, the ancient Egyptians created numerous artifacts from which methods of manufacture can be inferred. In 1883, Egyptologist Sir William Flinders Petrie remarked on the efficiency with which the ancient Egyptians cut hard igneous rock and concluded that on some artifacts circular saws must have been used.26
A Mechanical Method of Cutting Stone

However, to be effective circular saws require some type of power.
4 – A Patio of Machine Tool Evidence

At the Great Pyramid’s eastern face, a solitary granite slab sits next to the remains of large basalt patio. What type of granite structure or structures that were built next to the Great Pyramid, we will never know. The area has been picked clean. The only structure that remains of significance is the basalt patio that the local salesmen use as a rallying point in their daily routine. However, since whoever built the pyramids of Giza may have also built the pyramids and temple at Abu Sir, one of those structures was likely a temple. The basalt patio and its placement in conjunction with the Great Pyramid at Giza are similar to the basalt patio and pyramid at Abu Sir.

Figure 4.1 A solitary block of granite on the east side of the Great Pyramid
Giza’s Basalt Patio

For the tourist there is nothing of special interest with these basalt patio blocks except that they are ancient and provide an uncanny charm to an otherwise barren area. However, like everything else on the plateau a number of stones have been removed from the edge of the patio. Although the patio area would be more appealing if it were intact, its pilfered state allows its builder’s secrets to be exposed.
It is a riddle that an ancient civilization, which is believed to have been technically primitive, could not only build a single structure with the hardness rock known to man, but build a civilization out of it. In order to quarry and shape large quantities of granite to be used in the construction process they would have to have an efficient and effective means of cutting. The answer lies in a number of the Great Pyramid’s basalt patio stones. These stones offer evidence that whoever built the pyramids, and the patio, was experts in the technology of cutting and shaping stone.

The way in which any material is manipulated to create a product - whether by power tool, milling machine, or manual tool – the tool or process will leave its signature. It doesn’t matter if the material is wood, metal, or stone. There will always be evidence on the object’s surface describing how it was created unless it is polished or sanded away. And that too leaves it mark.

For example, structures and statues that were carved by hand, such as the crypts and tombs in the area west of the Valley Temple, just in front of the middle pyramid, are easily identifiable. The hand chisel leaves behind a slash mark or divot where it pushed its way through the rock. Such marks are easily identifiable on some of the Great Pyramid’s core blocks. Objects created with stone ‘pounders’ (round, fist-sized diorite stones), such as the granite box on display in the Memphis Museum courtyard, leave a surface scarred with pock marks or dimples. Once aware of how these various tools leave their marks the evidence is obvious. The surface of chiseled blocks has a rough and uneven surface. The surface of highly polished rock is smooth with an unmistakably reflective quality about it. Surfaces that have been cut in a high speed process also display certain marks. The handyman who has spent a lifetime using radial saws, table saws, and other power tools or the machinist whose career has focused on manufacturing precision products knows this.

Evidence of Powered Saws

Although it is certain that chisels and hammers did play a role in the construction process – workman today still use hand tools – there was something else was at work, something that makes the grand scale of the pyramids feasible, and the telltale signs of what process did the cutting are there if you know what to look for. This was what Christopher Dunn had discovered, and brought me to Egypt to help document.

Figure 4.4 Saw marks on a basalt block at the northern edge of the patio
The Stone at Abu Rawash

The surface of the basalt paving stones is cracked in places and worn away from what appears to be water erosion. However, a number of peripheral stones that have been exposed by pilfering show little signs of erosion on their sides, and there are no chisel marks visible. Where they have been broken they are rough and jagged. Otherwise, they are smooth and lack any tool marks except for where mistakes may have been made. These mistakes are important clues to the manner in which the blocks were prepared.

The most obvious mistake appears of the north end of the basalt patio. Apparently, on one block the workman who was operating the saw started a cut that would have created a stone too short for its intended use. Upon recognizing the mistake he withdrew the blade and made the cut higher up. Not once, but twice; then finally where the cut was supposed to be. Since the block was originally an inner block of the patio no one would ever notice, that is, until the site became derelict and some of the stones stripped away.

Among the basalt paving stones there are other mistakes made by ancient stone cutters. Most of which appear as grooves or channels biting their way through stone. The straight and even width of these grooves is beyond what could be accomplished by hand. If they were, in fact, cut by hand what kind of tool would be able to make such a deep and precise cut? What would its teeth have to have been made from?

A second stone exhibiting saw marks sits on the northeast side of the basalt patio. The cut originally knifes through a protrusion of rock but at some time in the past this protrusion broke off leaving what appear to be two separate cuts. A second cut, although fainter, exists several inches to the right of the cut.
Figure 4.6 Second basalt block with saw marks

Figure 4.7 Close up of saw mark in Figure 4.6 (photo rotated 67 degrees)
The Stone at Abu Rawash

A third stone exhibits ten saw marks (Figure 4.8) where all cuts are within an inch of each other. The cut marks might have been created before the block was placed since the saw marks appear to continue past the visible portion of the stone.
Figure 4.10 Saw Marks on fourth stone

Figure 4.11 Notice the flat surface on the fourth stone (photo rotated 100 degrees)
The Stone at Abu Rawash

Not far from the third stone exhibiting saw marks, at the far north end of the basalt patio, there is a fourth basalt stone with the same style of marks (Figure 4.9). However, this stone also displays a flat smooth surface where the stone was cut (Figure 4.10), a distinct characteristic of a mechanized saw.

A fifth and sixth stone (Figures 4.11 and 4.12) suggest that the saw blade used to cut the basalt paving stones was circular. Both exhibit a rounded shape to the cut.

Figure 4.12 Saw marks on stone #5

Figure 4.13 Circular saw marks on stone #6
Figure 4.14 Right side of saw marks in Figure 4.13

Figure 4.15 Left side of saw marks in Figure 4.13
Evidence of Machining

A seventh paving stone exhibiting a saw mark rests on the east side of the basalt patio. Uniquely, this specific stone was featured in a recent documentary. According to the documentary, this stone was allegedly cut by an ox-driven saw with a large weight mounted on top of the saw - in order to apply the cutting pressure.

What the documentary failed to mention was that this stone offers more evidence for the tool that made the cut. Below the cut the texture of the rock appears to be rough, but directly above its texture is smooth and displays minute lines evenly spaced horizontal to the cut. These minuscule lines are similar to machining marks today that machinists today refer to as ‘feed lines.’
In Figure 4.13 the section exhibiting feed lines is on the right side of the picture. (Figure 4.14) Of course, this photo is not a close-up so the lines are not visible. However, in Figure 4.15 which is a close up, the stone’s feed lines is easy to see.

Figure 4.17 Flat and smooth area of stone #7 where feed lines exist
Figure 4.18 Up close, feed lines are visible on stone #7
Two other stones at the edge of the basalt patio also exhibit machinist ‘feed lines.’ (Figures 4.16 through 4.19)
Figure 4.21 Close up of feel lines in 4.20 (inside the white box)
Figure 4.22 Third Basalt stone exhibiting feed lines

Figure 4.23 Close up of feed lines in figure 4.22
The Stone at Abu Rawash

There are other tool marks on other stones near the Great Pyramid. What is shown here are only a few. Interestingly, it was through advanced technology (the large mega-pixel digital camera) that lead to the discovery by Christopher Dunn that the pyramid builders employed some type of advanced technology to custom cut basalt blocks in creating a paved patio.

What the evidence indicates is that the pyramid builders mass produced stone blocks in order to create their structures, and then, if necessary, further shaped the stone by hand once the stone was ready to be placed in its final position. As a result, there is evidence for both simple tools as well as sophisticated tools in constructing the pyramids and other structures on the plateau.

However, the most astounding discovery by Christopher Dunn is located at a forbidden site called Abu Rawash.
Giza is always congested with buses, vans, and taxies carrying tourists between the hotels and nearby sites and workers from their homes to their jobs. The traffic is so heavy stoplights would make matters worse, so there are none. Policemen wearing white officer caps and navy blue vests stamped ‘Giza Traffic’ on the back direct by hand throngs of cars, buses, trucks, and an occasional mule driven cart. Their sleeves striped in neon green provide easy visibility for impatient drivers.

Compared to the bustling non-stop Giza traffic the short ride heading out of town, north on the Alexandria highway, is a pleasure. Traffic is less dense and the view magnificent. Unlike the streets of Giza where the tightly packed buildings block every view, the road to Alex, as local residents refer to it, is a vista of yellow and white dunes under a bright blue sky. No more than ten minutes away, still within Giza’s city limits, is a hidden treasure - the ancient ruins of Abu Rawash.

No roads exist leading to Abu Rawash, only a beaten trail in the sand where cars and trucks occasionally have made their way. Getting there, it seems, is as if our driver randomly exits the highway. Of course Farahat, a veteran driver, knows the way. Climbing the trail up the plateau is slow going, but the ancient ruins aren’t very far, and the desert is a refreshing change from the honking horns and speeding cars of Giza.

Few tourists visit the ruins at Abu Rawash, and you won’t find it on most maps. Officially, going there is forbidden but that doesn’t seem to bother the drivers and guides who earn their living from tourism. As such, there are no Tourism Police to provide security, but on the bright side, there are no sellers hawking their goods or asking for a picture.

A quarter mile or so up the trail stands a shack where two men patiently wait and watch for visitors. They guard the way. Guides they are, so to speak, eagerly awaiting adventuresome tourists in order to earn a few pounds Egyptian. In Egypt, it seems as if everyone wants a piece of the tourist trade. I don’t mind. It’s part of their culture and a necessary cordiality. ‘Baksheesh’ the Egyptians call it. Although this Arab term effectively means money, it really means ‘forgiveness’ I am told - a tip really.

![Figure 5.1 The unfinished pyramid at Abu Rawash, from the northeast](image)

One of the Abu Rawash guardians, a short man wearing a long, flowing blue tunic and a white turban, waves us down. Farahat and the guardian chat for a minute. “He wants to go with us,” Farahat says. We don’t have much of a choice so ‘our guide’ gets in the back seat with me, then it’s on to Egypt’s northernmost pyramid.
Abu Rawash’s pyramid complex rests atop small plateau nearly five hundred feet above the surrounding terrain. Unusual for typical pyramid placement; all other pyramids were built much closer to sea level. The view to the south is dazzling. Giza, the city, lies below; in the distant Giza’s trio of pyramids stretch into the sky, truly an amazing scene.

On the plateau it’s still and quiet. The ancient complex doesn’t look like much. As far as being a pyramid, built around an outcropping of natural rock there are a few courses of limestone blocks, about fifteen in all. The official story behind the pyramid is that is was built by an early fourth dynasty pharaoh, Djedefre who was the son of Khufu. According to the story, Djedefre, who was the son of a Libyan Queen, murdered his older half brother Kauab in order to become Pharaoh, since Kauab had a stronger claim to the throne. In the end, Djedefre, by the hand of his younger half brother Khafre, met the same fate he dished out to Kauab. Djedefre’s successor then demolished the site reducing it to a shell of a building in a field of rubble.¹ That was before thousands of years of weathering and scavenging.

Compared to the grandeur and beauty of the Sphinx poised at the east gate to the Giza pyramids, Abu Rawash’s pyramid doesn’t look like much of a pyramid.

However, looks are deceiving. On the north side of the pyramid the area for the descending passageway had been cut into the bedrock. Essentially a channel nearly twenty feet wide that empties into a rectangular pit. Egyptologists believe this rectangular pit was supposed to be the burial chamber and its ante chamber for king Djedefre. Even in its dilapidated state the pyramid’s megalithic blocks and excavation into the bedrock is a remarkable site.
Alone, I descended into the cool shadows of the pyramid, and wondered about the men who worked here so long ago. Who were they – really? How could they accomplish such a colossal engineering feat with the simplest of tools? Being there, in person, has no replacement. Unlike a thousand hopeless documentaries, there was no camera direction and no narrator to goad an explanation unworthy of this magnificent civilization’s ingenuity. How the pyramid builders accomplished the task of quarrying and cutting such large blocks of stone, and assembling them into a gigantic structure to this day is one of the deepest mysteries of history.

Even though nearly all the granite casing stones have long since been removed, on the first course of limestone blocks, next to where the descending passageway begins, there are two pink granite witnesses to the splendor of what was. Both of these stones are enormous beyond belief. Farahat helped Chris measure the easternmost stone. After some calculations, Chris said each must weigh close to sixty tons.
Over the millennia, whoever scavenged the granite from Abu Rawash was unable to move these two pieces. I assume they were left untouched because they were (and are) nearly impossible to move even with the heaviest equipment. Getting a sixty ton block of granite in the air, even a few inches, cannot be accomplished by brute manpower alone. The number of men required to lift the block would not be able to fit around the stone. Besides, why try and move such large stones since Abu Rawash’s pyramid, like so many others, was cased in granite. There was plenty more granite stones to choose from that required much less force, as numerous piles of pink granite on the plateau attest to.

Not far from the two granite witnesses stands an enigma; a three and a half foot tall granite pin or pillar. At least that’s what it looks like. What it really was when first made may never be known.

In contrast to the khaki-colored limestone blocks that make up the core of the pyramid, the pink granite is beautiful even though almost all of it exists as heaps and piles scattered around. Rubble at
A New Rosetta Stone

other areas is covered with the fine yellow powder deposited by the desert wind. The granite as Abu Rawash is clean, and displays bright speckles of quartzite laced in black and pink rock that sparkle in the sun; it is beautiful despite the destruction and demolition that occurred here.

Figure 5.5 Unknown granite (pin or pillar?) carving
The Stone at Abu Rawash

According to another driver and tour guide Mr. Naro Aziz, during the mid 1990’s French and German archeologists camped at Abu Rawash one winter and cleaned everything up. Before, he stated, Abu Rawash was a mound of rubble and dirt. Now, it is clean and the pyramid clearly visible. He must have been referring to the Swiss-French excavations led by Michel Valloggia. Evidently, all rubble, except the granite, had been pulled away from the base of the pyramid and disposed of. Remarkably, there may be enough granite strewn about to case most of the existing pyramid.

Although most of the granite is broken a few pieces have retained some of their original form. In one pile there is a square block. In another there is what looks like a casing stone, triangular in form. If the amount of granite strewn about is only a fraction of the granite used, what scavengers could not use, the original quantity of granite had to have been enormous.

Figure 5.6 Square block of granite

Figure 5.7 Possible granite casing stone
Figure 5.8 Christopher Dunn measuring a possible granite casing stone.
The Stone at Abu Rawash

Perhaps the biggest mystery of all is the long trench cut into the bedrock on the east side of the pyramid, several hundred feet from its base. According to Egyptologists, this long, deep trench (approximately forty feet wide and sixty feet deep) was a ‘boat pit’ where the solar boat was to be placed that the king would use on his journey in the afterlife. However, no remains of a boat have ever found at Abu Rawash. What was discovered were fragments of statues carved from red quartzite. Some time long ago they had been tossed into the trench. According to Egyptologists, more than 120 statues once adorned the site, most of which were the ruler sitting on his throne.

Figure 5.9 Deep trench (boat pit?) cut into rock on the east side of the pyramid
A New Rosetta Stone

Although Egyptologists attribute the pyramid at Abu Rawash to the early fourth dynasty, why the site was chosen and why it was never finished is an unsolved puzzle. Not only is it built high on a hill and a mile away from where the Nile was at that time. It was also, later, used as a cemetery even though it was believed to have been abandoned. The core on which the pyramid was built is honeycombed with more than thirty rock-cut tombs attributed to the fifth and sixth dynasties.²

Abu Rawash is a very important site. Not so much that it offers a view of a pyramid in progress, which is certainly unique and valuable, but that it contains irrefutable evidence of what was used to cut rock. To this day, the evidence is still there. Since I have never read about this evidence in any journal or seen it addressed in a film documentary, or even seen a picture of it on the Internet, apparently it is an unmentionable artifact, and possibly a secret. Indeed, a secret that should be confiscated, hauled away, crated, and hidden; locked away in the basement of the Cairo Museum forever; an artifact that no orthodox archeologist or Egyptologist would want to mention publicly, although former Atlantis researcher, now Director of the Giza Mapping Project, Mark Lehner might jump for joy.

I first learned about this stone at a conference in Kempton, Illinois on the sixth of May, 2006 hosted by Adventures Unlimited Press. My friend and colleague Christopher Dunn had returned that day from Egypt and drove straight to the conference from Chicago's O'Hare Airport. In his keynote address, the stone at Abu Rawash was the final photo in his presentation. While staring at the photo projected on the giant screen, I could hardly believe my eyes. If 'seeing is believing' then being there at Abu Rawash, touching the most significant find in the history of civilization is an experience of a lifetime. Nine months later Chris and I went to Egypt to complete the research for this book and I enjoyed that lifetime experience.

This incredible stone is located on the east side of the Abu Rawash pyramid about a third of the way south of the structure's northeast corner. It is approximately four feet wide, six feet long, and ten inches thick. Workers from one of the past excavation teams must have pulled it from the rubble and placed it atop seven softball-sized stones. In pristine condition, a result most likely of being buried for thousands of years, it now rests about thirty feet from the base of the pyramid. Someday, this granite slab may be as important as the Rosetta Stone, and for good reason.

It has long been speculated by those intrigued with history's mysteries that an ancient, technical civilization existed during remote times. Such speculation, popularly referred to as the 'Atlantis Syndrome' by skeptics and cynics alike has created resentment of sorts between so-called independent (non-academic) and professional (academic) researchers, what has been termed in the press as the 'Orthodox' and the 'New Age' camps.
Figure 5.11 The stone at Abu Rawash (view from the west)

Figure 5.12 The stone at Abu Rawash (view from the south)

Figure 5.13 The stone at Abu Rawash
New Age aficionados are alleged (by the orthodoxy) to believe unfounded theories while Orthodox folk are alleged (by the New Age) to ignore important evidence in their historical paradigms. For the New Age, the problem has always been the evidence, which for the most part is circumstantial and, some of which, is highly suspect. For the Orthodoxy the problem has always been the ability to explain the more mysterious aspects of ancient history, such as the widespread use of granite as a building material not to mention the existence of unique, large, and ornate granite carvings. Like the skeleton that tells a story to the forensics expert, so does the granite stone at Abu Rawash to the experienced machinist.

There is no mistake that a sophisticated technology was responsible for this stone’s existence. The stone measures approximately 56.75 inches long by 47 inches wide by 9 inches high. Its face or upright surface is smooth to the touch but not flat. Its surface is concave. At one end of the stone there is an arc separating the smooth surface from the rough surface. Chris Dunn determined that the radius was accurate over approximately 93% of the arc and using the dimensions of the chord (56.75 in) and the sagitta (1.42 in) also determined that the radius the arc belonged to was 23.684 feet (7.218 m).

Upon close inspection of the smooth portion of the stone, tiny lines – nearly microscopic - are visible across the width of the stone, in the same direction as the arc. You can’t feel them with your hand but you can see them if you look real close. Whatever device cut on this stone it left grooves approximately .050 inch wide, which would normally be associated with the feed rate of the saw, but could also indicate a blade with multiple cutting teeth.
I talked with a granite expert at a local custom stone shop about ancient Egypt and methods of cutting stone. He insisted everything in ancient times was carved by hand. But when he viewed the photos of the stone at Abu Rawash all he could was, “That’s crazy!” He said it three times and then finally exclaimed that “that had to have been done by a milling machine or something to make that type of cut.”

There are five facts of great interest about this stone. First, whatever tool cut this slab of granite did so with relative ease, since the quartz crystals in the rock were cut as smooth and flat as the feldspar. Secondly, the tool that made the cut left an abrupt, exact terminating line in the shape of an arc between the smooth and rough portions of the stone. Thirdly, whatever tool made the cut also rendered the stone concave along its width. Fourthly, there are two slice marks (or steps) exhibited on the stone’s smooth surface. One is near the termination arc and the other on the opposite end. And fifth, there are machinist ‘feed lines’ in the smooth part of the stone along its breadth the length of the stone.
Figure 5.17 Precise arc line separating smooth from rough end of the stone
Figure 5.18 Feed Lines left from the device that cut the stone
(Photo Courtesy of Christopher Dunn)

Figure 5.19 Concave surface shape of the stone
Explaining these five features of the stone at Abu Rawash is difficult to do by claiming that simple hand tools were responsible. And, when taking into account the feed lines, it is impossible. If an ox-driven saw was the tool used why would there be an arc-shaped termination line?

It could be a hoax, but if it were who would have the funds and the tools to accomplish such a feat? A granite slab would have to be purchased (very expensive) then cut, and transported to Abu Rawash. The hoaxter would have to be a granite worker with access to expensive machinery or a very rich man with good connections.

What makes a hoax highly unlikely is in the way the stone was cut. Whatever tool cut the stone it left not one but two concave surfaces. One concave surface has already been discussed, the arc that separates the smooth surface from the rough at the end of the block. The second radius, or concave surface, is in the depth of the stone’s smooth area. So, the middle of the stone is thinner than its sides. How these two concave features of the stone - technically two radii - were created is the likely answer to what tool made the cut. It may also explain what the stone probably was used for.

It is difficult to image why anyone would cut any stone into this shape, today, a hundred years ago, or five thousand years ago. After contemplating how a material could be shaped by a single cut Christopher Dunn came up with a plausible answer. The slab might have been waste material in the process of cutting a triangular casing stone.

According to Dunn, the stone has two radii on two axes, which indicate that a popular machinist’s technique might have been used to achieve a cut larger than the diameter of the saw being used. Such a technique, in theory, would result in ‘waste material’ the same shape as the stone at Abu Rawash. Using a milling cutter, Dunn tested the theory at Danville Metal Stamping, a precision manufacturing company in Danville, Illinois.

Dunn placed a rectangular piece of composite plastic in the vise of a Bridgeport-style milling machine and tilted the saw at an angle. Cutting the plastic block in this manner would turn the block into a wedge. If the block was too long for the desired size wedge, the waste material would be in the form of flat rectangle. So, allowing for waste material Dunn made the cut. The result was a wedge-shaped object, two of its sides forming a right triangle, and waste material in the shape of a rectangle. The hard plastic waste material, as does the stone at Abu Rawash, contained two radii, one along its face and the other along its depth. Although much smaller that its granite inspiration, the rectangular piece of plastic was an exact duplicate.

Such a cutting technique Dunn used not only explains the concave shape of the stone and the termination arc at its end, but also the feed lines as well as the single rough end. As the saw neared the end of the block the waste material broke away, like a half-way sawn tree branch breaking under its own weight. It also explains the slice or step marks in the surface. Whoever was operating the device changed the angle of the saw.

All the evidence about this stone suggests that the granite slab was cut with some type of saw, but what size saw would make a cut on a block of granite 47 inches wide and 56 inches long?

According to Dunn, the diameter of the saw can be determined with a few calculations. Since the surface of the granite is concave the saw must have been at an angle, or perhaps the granite block was fed into the saw at an angle. So, by knowing the dimensions of both radii an accurate calculation of the saw diameter can be made.

The radius of the saw, based on the arc across the face of the slab, was 22.134 feet (6.746 M). And since the saw must have been on an angle a simple formula can be used to determine with reasonable certainty the diameter of the saw and the saw’s tilt. Thus, according to Dunn’s calculations the saw had to have a diameter of 35.9 feet and an angle of 46.5 degrees to produce both radii present in the granite slab. He tested these calculations with a 1/61 scale model and found the results to be comparable to the photograph of the granite. Furthermore, duplicating the stone at Abu Rawash in a scale model also created a block characteristic of a pyramid casing stone.
In Dunn’s opinion, there are other features at Abu Rawash and Giza that might explain everything. Not far from the stone at Abu Rawash there is a deep trench cut into the bedrock. Similar trenches exist at Giza on the east side of the Great Pyramid. Although these trenches have been labeled “boat-pits” because of their shape the trench at Abu Rawash is narrow and deep so it does not accurately represent the shape of a boat. For Dunn, it is plausible that these trenches were originally used to mount a saw where the bottom half of the blade resting in the trench.

A large saw such as this would obviously require power of some kind. This, of course, creates a paradox according to the standard model of history. The ancient Egyptians did not – could not - have any kind of power other than what can be provided by man or beast. Yet, the stone at Abu Rawash testifies that power was somehow being generated in order to cut granite.

For Dunn this is not so surprising since “a culture able to conceive and build the largest and most impressive structures on the planet did not limit their superlative efforts to just the building, but also the tools they used."

In 1883, Sir William Flinders Petrie noted that circular saws must have been in use when he noted parallel arcs existed in artifact No. 6. Although they had been polished out the grooves were still visible. For Petrie, “the only feasible explanation of this piece is that it was produced by a circular saw.”

It takes extraordinary evidence to support extraordinary claims, the saying goes. At Abu Rawash this single slab of granite does just that. It’s irrefutable, and paradigm changing - a new Rosetta Stone. The stone at Abu Rawash needs to be explained.
Memphis is a small village today but more than three thousand years ago it was the center of Egyptian civilization. A few miles south of Giza, today, little remains of the ancient capital but what has survived offers extraordinary insight into the past. Like the granite boxes of the Serapeum and Abu Sir, several artifacts defy explanation.

One of Memphis’ most impressive monuments is a colossal statue of what is believed to be the image of Pharaoh Ramses II. Made of limestone, and now sheltered in a concrete structure, the statue is so large that its protective building had to be two stories high, and that’s with the statue lying down. Placed upright, the statue would be close to forty feet tall. On its back it is nearly ten feet tall.

Viewing the face and chest of this monstrosity from ground level is nearly impossible, unless you are close to seven feet tall. The balcony, however, offers a unique view that spans the width and length of the building. It’s impossible to capture the entire statue in a single frame of film unless you are using a wide angle lens.

Despite its gigantic size, the detail is incredible. In perfect proportion the face of Ramses is not only convincing but convincingly alive. His chest gleams in the sun; smooth rounded pectoral muscles complete with nipples top a trim waste above a ribbed apron, finely carved. His belt and buckle carved
in relief boasts the sacred writing of the hieroglyphic style. It looks like it was finished yesterday. But it is his face that is so captivating. His countenance smiles, it shines with the kindness of benevolent and merciful ruler.

Figure 6.2 Colossal limestone statue of Ramses at Memphis
There are two other giant statues in the museum’s northern courtyard, although not as impressive as the covered statue of Ramses. A fourth colossal statue discovered at Memphis was moved to Cairo during the 1950’s and placed in a park square by the Bab Al-Hadid train station. In the summer of 2006 this eighty-three ton statue was moved to Giza. There, it will become one of the main attractions for the Grand Egyptian Museum, scheduled to open in 2010.

The puzzling part of these statues is not just the size, although that is an incredible feat in itself, but that three of them were carved in granite. This means that blocks of granite at least forty feet tall and twenty feet wide had to be quarried, transported, carved to specification, and then erected; a difficult task even today. With modern technology stone blocks the size of these Ramses statues are cut with extraordinarily large machines, some as big as a bus, and are typically used as raw materials scheduled to be further reduced for counter tops, pillar facings, patio tiles, or cemetery headstones. Despite the high level of technology our civilization has achieved today, there is no company or person with the skill to recreate the colossal granite Ramses in the fine detail of a human being.
Figure 6.4 Upper portion of a sixty-foot tall granite Ramses statue from the Ramesseum, housed at the British Museum
Ramses Legacy

Colossal statues have not only been found at Memphis. At Tanis, eighty miles northeast of Cairo, among the ruins are two broken colossal, sandstone statues of Ramses II and a third statue, still intact, next to the temple pylon. Like the majority of ancient sites, the entire temple area is littered with granite blocks, some of which are elegantly inscribed. Five hundred miles to the south, at the ancient city of Thebes, there is the Temple of Karnak, the Temple of Amun-Mut-Khonsu, the Temple of Amenhotep III, and the Ramesseum. Each boasts statues of mammoth stature. Although there is nothing left of the Temple of Amenhotep, the seated Colossi of Memnon reach sixty feet into the sky.

On the west bank of the Nile, at the Ramesseum the largest granite statues ever carved once stood. One statue lies where it was toppled, next to the remaining columns of the temple. According to estimates, the statue was sixty feet tall and weighed 1200 tons when completed. The bust of another Ramses now takes center stage in the Egyptian wing of the British Museum, which was one of the seated versions of the colossal Ramses. A pair of seated Ramses was set up in the temple. Amazingly, the Ramses bust in the British Museum was made from granite containing two colors. According to the British Museum placard, the stone workers who designed and carved the statue used the change in colors to draw a distinction between the body and head of the statue.
The Stone at Abu Rawash

Figure 6.6 Ramses head at the Ramesseum
(Courtesy of Saxon De Kock)
Figure 6.7 The Colossi of Memnon
(Courtesy of Saxon De Kock)
Figure 6.8 Forty-foot tall seated Ramses statue inside the Temple of Amun-Mut-Khonsu
(Courtesy of Christopher Dunn)
At Thebes, in the Temple of Amun-Mut-Khonsu there are four more statues of Ramses, seated and wearing the Hedjet, the white (bulbous) crown of Upper Egypt. Two statues guard the entranceway to the temple. Two more greet visitors as they enter the temple. Like their upright versions these seated statues of granite are also giants approaching a height of forty feet.

Perhaps the most interesting aspect of these colossal statues is that it appears the craftsmen who carved them were using a pattern, or at least a standard ideal of what the statue’s face should look like. Whether in Memphis or in Thebes the Ramses face has a distinct and familiar look: large almond-shaped eyes, rounded cheeks, full lips, and a beloved smile. The Ramses’ countenance is unique in that its soft almost youthful smile is accompanied by the wisdom and experience of an older man strapped on through an honorary beard. This tender look the artists gave to Ramses provides a feeling of ‘warmth’ to the statue, almost as if the statue is in some way alive. The face is carved with such purity and beauty that one cannot be sure if the posing model was male or female, or if there were a model. With such delicate features only the beard suggests that the image depicted is male.

How is it that a ‘warm’ feeling radiates from the statue’s face has to do with perfect geometry. The Ramses face is perfectly symmetrical. So, when the face is bisected each side is an exact mirror image of the other. Put together they reconstitute the original face, unlike the typical human face, which, although appears symmetric is almost always asymmetrical in various degrees. For us humans, symmetry defines beauty. The more asymmetrical a face is less attractive it is.

Artists paint, draw, or carve their materials to achieve a specific ‘look and feel’ in their work. For example, Michelangelo’s sixteenth century sculpture of David depicts a perfect yet lifelike figure of a man, to the detail of sinuous muscles. The same is true for the Venus de Milo which depicts the beauty of women. Both of these statues were carved as if models posed for the artist. In abstract art, such as
The Stone at Abu Rawash

the untitled steel statue in front of Chicago’s Richard J. Daley Center, the viewer is left to his own interpretation. However, the statues that adorn the Temple of Amun-Mut-Khonsu are neither lifelike nor abstract. They are geometric, carved into near perfect proportion.

The Greeks are well known for their hand-carved lifelike statues. Side by side, a Greek statue from the British Museum compares poorly to the Ramses statue from Luxor. The Ramses head appears cartoon-like in contrast to the Greek carving, and the Greek statue certainly appears lifelike.

As a result, it is a fair to conclude that the Ramses statues were not patterned after any particular individual such as Ramses, but were a representation, and symbolic of some ideal.

If the Pharaoh Ramses was the commissioner of these statues then why didn’t he order his likeness carved into granite immortality? What’s more, why would the civilization that built these statues build
them in the manner that they did? Since art is typically a social commentary, or an expression of someone’s inner vision of society conditions, then what might the Ramses statues reflect or symbolize?

The answer to these questions, I believe, is as much philosophical as it is technical.

Ramses as Philosophy in Stone

There are two exceptional qualities about the Ramses statues at Luxor, as well as the other Ramses statues at Memphis and the British Museum. They were carved on an enormous scale. Even more incredible, they were carved from the hardest rock known, granite. Thus, the carving of these statues entails much more than an artist’s talent. Making such a huge object is a distinctly technical, engineering accomplishment which is based not on individual skill, but on the technical expertise of a culture or civilization that has had time to develop specialized industries within its economy. Only in this way could the know-how have been cultivated to accomplish such a feat that includes not just the statues but the temple building as well.

Within the context of the temple complex, the perfect geometric proportion of the statues not only demonstrates technical precision but it also makes a philosophical statement in concordance with the theme of the Temple of Amun-Mut-Khonsu. Art and science are reflected in modern society’s structures. Statues held a special place thousands of years ago as much as they do today.

For example, dressed in his 1917 U.S. army uniform and regalia, the ‘doughboy’ statue of a World War I veteran does not represent an individual, but the sacrifice of thousands men and their families. Philosophically, it may also represent the courage and dedication which that generation of people exemplified. On the other hand, the seated statue of Abraham Lincoln in Washington’s National Mall represents the man. Yet, it also represents the concepts that Lincoln himself stood for. In fact, the Lincoln Memorial is a temple dedicated to concepts such as emancipation, preservation, inspiration, hope, and union. Lincoln sits majestically, his arms resting on each side of his throne. A dignified look assures us he was a great man. But his throne is not the throne of a king. It is the throne of a nation, a civilization. The statue of Lincoln itself was specially designed by artists to evoke feelings of patriotism and altruism in honoring the civil rights of all men. Likewise, the megalithic granite Ramses in the Temple of Amun-Mut-Khonsu evokes similar feelings.

Just as our civilization today, every civilization or culture that has existed was propelled by an underlying ideology or philosophy. The ideology and philosophy of western civilization is one of democracy, the scientific method, a free market economy, and beliefs associated with the Christian tradition. Civil organization and technical advancement is its result. Important and scared structures, public buildings and churches, reflect this. In many cases today’s architecture is aesthetically pleasing yet ‘plain,’ achieved through simple geometric measures.

During the Middle Ages, commissioned by the Church, the great European cathedrals were designed to evoke emotions of awe and reverence. Aside from the science and technology involved in the construction process, these magnificent structures were also built with an underlying philosophy, a philosophy that embraced the message of Christ, skillfully explained in the 1926 book *Mystery of the Cathedrals*. Just like our modern civilization, past and present, the art and science that went into the ancient Egyptian temple construction reflects the ideals and skills of the civilization that created it. However, exactly what those ideals and skills were has always been a matter of debate.

In the same way construction projects in ancient Egypt are believed to have been accomplished by the use of simple tools and brute force, Egyptologists believe that the ancient Egyptians held simplistic religious beliefs such as animal worship and that being Pharaoh also meant being a living god. The difficulty with appropriating religiosity to temples, monuments, and murals is that the concept of religion is the result from the late nineteenth and twentieth century’s. In general, it was believed that old meant primitive and savage. If you have ever been to Luxor you would certainly realize that the
Temple of Amun-Mut-Khonsu, an enormous asymmetric complex built upon three different axes, was anything but primitive or simple.

The temple is not about the piety of a man. Not only is it a tribute to the technical know-how of the civilization that built it, but a testament to the philosophy that made Egyptian civilization great. Amun, Mut, and Khonsu are not ‘gods’ but principles that form and explain the nature of mankind as coherently as such an abstract subject can be explained. In fact, this theme of mankind’s identity is seen through ancient Egypt. The enormous granite statues at Memphis, Tanis, and Luxor were the celebration of civilization and mankind as the essence and culmination of Nature’s principles. Just like the ancient historians declare - the temple was an institution of higher education - the temple was (and is) a form of communication, a lesson, and at its core was the builder’s philosophy carved in stone.

Figure 6.12 The Temple of Amun-Mut-Khonsu seen at night
(Courtesy of Christopher Dunn)

The definition of Man and the story of the human experience was built into the temple architecture. Physically, the temple describes the structure of man, from the importance of the femur in the creation of blood cells, to the role of the pineal gland in the brain. Spiritually, the temple conveys life’s cosmic drama and Man’s spiritual immortality.

Amun was the ‘Hidden One’ or the ‘Invisible One,’ what is best described today as the western concept of God, omnipotent and omnipresent. He was self-created, the creative power and source for all life, in the heavens and on Earth as well as the Underworld (the spiritual world for the deceased). Mut, which means ‘mother,’ was the cosmic wife of Amun and the mother of ‘the son’ who was named Khonsu who represented the king.

However, the kingship of Khonsu is not a physical kingship but refers to a cosmic (or spiritual) ruler that was made flesh through the forces of nature. Khonsu as the king represents the essence of mankind, the archetypal ‘Man’ essence of all who ever lived, is alive now, and will live in the future. Khonsu, by being associated with Re and Thoth, represented the essence of life’s energy and Man’s wisdom and knowledge where mankind is a consequence of the universe’s evolution that culminates in the physical endowment of the universe’s self-perception. In myth, Khonsu was a lover of games, but was also the principle of healing, conception, and childbirth. Literally, he was ‘the king’s placenta.’

These three gods (neters where are actually natural principles) - Amun, Mut, and Khonsu - were known as the Triad of Thebes but they were never meant to be worshipped as God or gods. They represented a teaching; a lecture carved into the temple wall declaring the philosophy of the archetypal
Man and the mystery of mankind’s origin. This was the underlying theme behind Luxor’s Temple of Amun-Mut-Khonsu as well as the essence of pharaonic office.

Figure 6.13 Standing Ramses with diminutive female figure
(Courtesy of Christopher Dunn)
This concept ‘Man as the Cosmos’ explains why the designers of the temple’s statues carved the diminutive female figure into nearly every Ramses statue. (See figure 6.13 and 6.14) The smaller female statue at the feet of Ramses represents the manifest of mankind. The figure is female because it is only through the female that mankind, as well as all of Nature, reproduces. In essence, the female form is the quintessential man embodying the creative and nurturing forces that exists in all biological forms. She represents mankind since she is responsible for man’s creation in the womb and his nurturing as a boy. The colossal Ramses statue represents the androgynous archetypal Man, the cosmic principle of Man (which includes both male and female natures) as the ultimate expression of the universe. The scene carved into the side of Pharaoh’s chair offers the explanation in the uniting of cosmic and natural principles described by the litany of the bulrush and the lotus. The scene represents the lower and the upper realms, the microcosm and the macrocosm, coming together or being tied together as a single existence. (See figure 5.15) This is in the Hermetic sense that ‘as above so below.’

Understanding the concept of Man as the Cosmos allows a more accurate and more appropriate view of ancient Egypt. The king was only a ‘god’ in the sense that he symbolized all men as the divine expression. The ‘god-king’ was to be understood as the reality for all men, not to be worshipped as the living divinity embodied in a single man. Only this explains with meaning the androgynous and perfectly geometric statues that adorn the temple. Thus, the colossal statues themselves hold the key to their interpretation. Geometric form is Nature’s secret, and it is through the form by which Man experiences. Their perfect geometric and androgynous shape, clearly visible in the face, references the abstract and cosmic principles of Man. In this sense Man is the Cosmos.

So, the pharaoh was as much a symbol as he was a king, and a pretext for embodying the mythical and the mystical nature of Man. Literally, the mythology declares that the birth of Ra (the sun) is a cosmic expression where the pharaoh represented the fact that our physical lives are dependent upon the dynamics of the universe and primarily the sun. In other words, the life of mankind cannot be separated from the universe. Ramses was the energy of the sun that the cosmic expression of Man becomes the flesh of men, so Ramses represents the cosmic birth of the archetypal Man as physical men. Accordingly, there is little wonder that Ramses is the widest and most encompassing expression of the king found throughout ancient Egypt. Ramses as the principle of the sun’s birth through cosmic principles was the core of their civilization’s philosophy.

Although the temple does not offer a not literal explanation westerners are accustomed to, in its totality the Temple of Amun-Mut-Khonsu was a symbol that could be intuitively understood regardless of language. In every room and corridor, the esoterism of symbol is bonded with the exotericism of science, with the purpose of addressing the eternal question of Cause and Effect.

The concept built into the temple was also remembered as a story. In myth, Seth represents the creative principle that puts man into physical form. He represents the active principle of the abstract becoming form is Ptah, or the ‘fire in earth.’ So, it is Seth’s nemesis, Horus, who animates the king. However, Horus must be delivered from his bodily prison in the same way the mortal’s soul must be saved, and in the end becomes the divine and perfect being. Thus, Horus represents all phases of creation, from the becoming to the resurrection and return to the source. In this way, the universal Horus is the divine presence in all that exists. Temple inscriptions explain this as a ritual where the royal fulfillment of Horus goes through phases in becoming a glorified body. In the end, Horus becomes the “King of divine origin, almighty in things of created Nature.”

The Temple of Amun-Mut-Khonsu anthropomorphizes Horus’ becoming and return, which is really mankind’s state of existence. In the ‘theogamy chamber’ (the marriage of the gods) the spiritual birth of Amun-Ra is told as the royal infant who is baptized and named though celestial forces. The terrestrial father, the god, assumed the form of Thothmes IV, and Queen Mut-m-ui (Mut in the barque), the spiritual mother, became pregnant by him. Then, Amun announces that this future child-king will be Amun-hotep heq-us, the hotep of Amun, as leaven of the rising flux. Khnemu, the divine potter from
A Philosophy in Stone

Elephantine, announces the child’s conception and fashions his form more beautiful than that of all the Neters. With the assistance of celestial principles, the child is then brought into the world to be nourished with the milk of the ‘heavenly cow’ (Hathor) from which all beings have life.

Figure 6.14 Seated Ramses and diminutive female figure
(Courtesy of Christopher Dunn)
This story of the king’s birth is symbolic and esoteric, and does not refer to any specific individual, but symbolizes mankind as a totality. It is the ‘becoming’ of mankind as the physical universe, and ultimately as men. From a Christian perspective it is the same concept as the biblical Logos where the divine Word of the beginning is the ‘All,’ or the undifferentiated state of existence that is the nature of the ‘Self.’ It is the same philosophical view as the Christian revelation of divine incarnation, but in the Egyptian Mysteries it was called the reconciliation of Seth and Horus. Such an insight helps explain why the Pharaonic sages considered the precessional transition from the age of Aries to Pisces, a natural progression toward Christianity as foreseen by the Egyptian temple, and why the first Christians chose the sign of the fish as their standard.

Life is spiritual and this understanding of Man’s ‘becoming’ creates unity and harmony for the individual as well as society. Thus, the return to the source is not only the aim for the king but for all men. In ancient Egypt this philosophical view of life was represented in mythology by the resurrected Osiris – the true King – who become enlightened (understands the true anthropocosmic state of existence) and returns to the source.

Science and philosophy are different aspects of a single body of knowledge. So, wherever there is advanced technology there is also advanced philosophy. There is no other superior philosophy or view of nature than what has been described, ancient or modern. Such a philosophy had to have been based on advanced knowledge of the natural world, and an intuitive understanding of Man’s nature. Ironically, it is the same philosophy that is emerging out of today’s ‘New Science.’
As for the construction of the pyramids, expressing philosophy was not their intent. Meeting the needs of civilization was. The pyramids functioned not as ‘resurrection machines’ but as a network of devices benefiting the entire civilization.
7 - A Tomb of Assumptions

Egyptology claims that beyond reasonable doubt Egypt’s large pyramids were built as tombs for the Old Kingdom pharaohs. Even so, despite tens of millions of stone blocks used in their construction, from Meidum in the south to Abu Rawash in the north, in no place is the name of its builder or owner inscribed, a controversial quarry mark in the Great Pyramid notwithstanding. In fact, the notion that the pyramids were tombs is one of the greatest assumptions in all archeological research. The evidence is so scanty there is actually no evidence that the pyramids were tombs. In some instances the decision to attribute ownership was made on the basis of tombs in nearby cemeteries, for it was assumed to be customary the king’s servants and courtiers be buried near him.\(^1\)

Recently, proof that a multitude of fourth dynasty workers built the Giza pyramids comes from a cemetery a half-mile south of Giza. Egyptologists assume that this cemetery contains the remains of the crews that built the pyramids because of the condition of the bones (they worked hard) and the cemetery’s proximity to the pyramids. Yet, there is no conclusive evidence to link those who were buried in the cemetery to pyramid building.

Tomb Theory Foundations

According to the tomb theory, the earliest kings of Egypt were buried beneath a rectangular structure made of mud brick, called a mastaba. The tomb consisted of a large open pit, dug deep into the ground, and partitioned into rooms, the center room being the burial chamber. Over the pit, a roof was built using timbers as the supporting structure. At the pit’s edge, thick mud-brick retaining walls were built extended above the ground, which created a hollow space above the roof and below the top edge of the retaining wall. This hollow space was filled in with rubble, gravel, mud-brick, or a combination thereof, thus creating a low, bench-like building.\(^2\) In essence, the mastaba was a large, rectangular headstone. According to the tomb theory, within fifty years building technology jumped from the second dynasty’s stone lined pits to the step pyramid, and then a century later it jumped again to the monstrous spectacular stone pyramid of the Giza Plateau.

Origins of the pyramid-tomb theory date back to the beginning of Egyptology. During the late nineteenth century, British archeologist Sir William Flinders Petrie (1853–1942) excavated eleven royal tombs that included the tomb of the first dynastic king, Narmer (c.3100 BCE), eight more first dynasty tombs, and two second dynasty tombs. Also at that time, at Giza, George Reisner (1867–1942) charted the development of royal burials through the Fourth Dynasty. What Petrie and Reisner discovered drove them to believe that the pyramids were tombs. The Egyptian nobility and their families were systematically buried underneath mastabas around pyramids.\(^3\) Thus, with their proximity to these cemeteries the pyramids also had to be tombs.

Later, proof for the tomb theory was found in Nubia (modern day Sudan), Egypt’s southern neighbor. During the sixth and seventh century BCE, Nubian kings were entombed in small, steep-sided pyramids. And, painted on the walls of the burial chambers are Egyptian-style scenes of burial rites. Accordingly, the Nubians borrowed this tradition from their northern neighbors, the Egyptians.

With this in mind there had to be a logical, linear sequence to pyramid building. So, it was conceived that during the third dynasty (c.2800 BCE) the Pharaoh Djoser decided that the standard mastaba wasn’t enough. Under the guidance of the architect Imhotep, Djoser built the first pyramid at Sakkara was, known as the Step-Pyramid. The Step Pyramid started out as a mastaba, but through three phases of construction was transformed into a pyramid. Later, in subsequent dynasties, each pharaoh had to outdo his predecessor, which resulted in more pyramids being built at Sakkara and the three massive ones on the Giza Plateau. As a result, Giza became a necropolis and “the site of the dead
A Tomb of Assumptions

pharaoh’s mystical transfiguration, re-birth, and ascent into heaven.” It was also “his residence in the beyond, from which he ruled over all the people of his time.”

Figure 7.1 Mastaba No. 17 at Meidum

In conjunction with the tomb theory there was another more political reason for the pharaoh’s tomb-building desires. The state ideology behind pyramid construction, according to the tomb theory, is that the people needed a project to bring them together as a nation. Accordingly, every household throughout Egypt sent men and food on a seasonal basis in dedication to the king and the building his tomb. What better project than the largest tombstone known to mankind – mausoleum is more accurate – to rally the people and put a few dollars in their pockets? Egyptologists now believe that everyone involved in pyramid construction received compensation.
The Stone at Abu Rawash

The most recent interpretation of the tomb theory is that the pyramid was a ‘resurrection machine.’ But exactly how a pyramid worked as a vehicle for transfiguration, and how the king ruled his people in the afterlife, has never been fully explained.

Unresolved Aspects of the Tomb Theory

Despite the claim that the pyramid was a tomb a number of Egyptologists recognize ‘the pyramid mystery.’ According to Egyptologist Dr. Miroslav Verner, Director of the Egyptology Institute at Charles University in Prague, “They [pyramids] still challenge us to explain why and how they were built. And in many respects they remain a great secret of the past.”⁵ Even Zahi Hawass, the Secretary General of Egypt’s Supreme Council of Antiquities, seems to agree on this point and states that the “Pyramids have magic and mystery. Its magic touches your heart, and when it touches your heart, you think about how they were built.” Interestingly, he also asks, “Who built them?”⁶

One of the more important questions concerning the construction of Giza’s pyramid is one of economic. How much does 2.5 million blocks, each weighing between ten and fifty tons, cost?

According to engineer Markus Schulte of the global design and business consulting firm Arup, today, the 5.9 million tons of limestone would cost 18 billion dollars. Add to that 50,000 laborers working for ten years at a cost of 255 billion dollars, plus thirty percent for general contracting costs then the total bill for the pyramid would be 380 billion dollars. However, using modern techniques great savings could be acquired lowering the cost to somewhere between thirty to thirty-five billion dollars.⁷ Such high costs, for any project tomb or not, require justification. Why would any society devote such a huge amount of resources to a tomb?

One possible answer is that the constituent Egyptian was naïve and had little input into the management of public projects. However, without foremen and managers, no large project would ever be built. So the middle managers as well as upper management (those who oversaw the project’s design and construction), were also naïve and willing to follow the king’s wishes. As a result, the Egyptians spent a vast amount of resources during the Old Kingdom’s five hundred year existence, and in return, received nothing of utility for their service or their society. Not a very believable answer during any period of history.

Besides the incredibly large price tag on pyramid building there are other, more evidential, problems. If the king was willing to spend his vast wealth on a tomb, then why didn’t he order a palace residence to be constructed during his lifetime?

A royal residence for any of the pharaohs of the Old Kingdom has never been found. Furthermore, Egyptologists have not ascertained why one king built at Giza and another king somewhere else, such as Sakkara or Dashur.⁸ Consequently, the tomb theory does a poor job of explaining the Old Kingdom pyramids. Furthermore, the tomb theory fails to explain anything pertinent about those pyramids as they relate to ancient Egyptian society outside of Osiris resurrection mythology. More importantly, in my opinion, if a civilization – any civilization - has the technical expertise to build structures on a massive scale then it is certain that civilization had to operate in a rational, realistic, and efficient way. So, why would the ancient Egyptians have spent nearly all their resources to construct a ‘resurrection machine’ that would never be used for anything productive?

Such an idea eludes the principles of civilization building, for it is unlikely that a technically sophisticated society would condescend themselves as a result of farcical beliefs, and then make those beliefs the primary role of their civilization. The evidence does not support, and is entirely inconsistent with such a stupendous farce as a 35 billion dollar tomb!

The Egyptians may not have delineated mathematical axioms as we are accustomed to today, but they were exceedingly proficient in their application of those principles. Both the Rhind and the Moscow papyri show that “they possessed sound practical knowledge and knew how to make the fullest use”⁹ of those principles. Their repertoire of knowledge included a decimal system, the use of fractions, and the
calculation of geometric areas for the rectangle, circle, as well as the surface of a hemisphere; and volumes for pyramids, cylinders, and cones. Most importantly, they were aware of the relationship between the sides of a 3:4:5 (right) triangle – known to the modern mathematics as the Pythagorean Theorem.\textsuperscript{10} Although there is no evidence to suggest that they theorized about \( \pi \), the evidence indicates that in practice, it was used.\textsuperscript{11} However, this in itself is inconsistent since philosophy and science are different aspect of the same concept. How can a civilization carry out advanced construction projects with such genius yet remain primitive in their thinking?

**Pyramid Design and Building**

The most difficult of problems with Egypt’s pyramids is an engineering riddle. How did the ancient builders create such a massive structure “so finely dressed that it is barely possible to insert a playing card between adjacent stones?”\textsuperscript{12} According to Columbia University Research Scholar of Middle Eastern Studies, Ogden Goelet:

> If we assume that Khufu reigned for fifty years and that his builders worked at a breakneck pace ten hours a day, one enormous block had to be added to the pyramid every four minutes or so — every day for fifty years, inexorably. Only the precision scheduling, rigorous planning, and careful organization of an efficient, honest, and clear-thinking bureaucracy could complete a project like this.\textsuperscript{13}

The prevailing theory is that pyramid building was accomplished with a combination of ramps, sleds, and lifting devices, in conjunction with a highly effective system of labor.\textsuperscript{14} However, if ramps were used to move stone up and into the pyramid, the ramp itself with a volume of 1,560,000 cubic meters and a height of 146.6 meters. The ramp would have been as big a project as the pyramid and a marvel itself.\textsuperscript{15}

In recent years, there have been attempts to establish as fact that multi-ton stone blocks could be moved with sleds under sheer muscle power. All of these have failed, which is an important piece of evidence in itself, and leads to a suspicion that fourth dynasty Egyptians did not build the three Giza pyramids.

The most recent theory how the pyramids were built comes form Jean-Pierre Houdin, a French architect, and his father Henri. According to Henri and Jean-Pierre Houdin, ramps were used but not in the external way Egyptologists have typically theorized. Instead, external ramps were used to raise blocks for the first third of the pyramid. Then, in order to raise blocks further an internal ramp was built into the pyramid itself, just inside its outer edge. Logical in its approach, this theory is likely the best theory since it is also supported by evidence.

During the 1980’s a French team performed a microgravimetry survey of the Great Pyramid in search for possible hidden chambers. Although they found none, what they did discover is a less dense region of blocks spiraling around the pyramid at its outer edge. In the twenty years since the survey was performed this less dense area has been a mystery. Now, with the Houdin theory of pyramid construction, such an area should exist if, in fact, inner ramps were used to move blocks into higher areas of the pyramid.\textsuperscript{16}

However, even if we knew the process used to build the pyramids there still is the problem of how its builders quarried, shaped, and shipped millions of tons of stone to the construction site. According to Merle Booker, the technical director of the Indiana Limestone Institution of America, if a company were to build the Great Pyramid today it would take twenty-seven years to fill the order for 131,467,940 cubic feet of stone, assuming that the thirty-three limestone quarries operated three shifts per day and there were no work stoppages. This is, of course, using the most modern quarrying equipment available for cutting, lifting, and transporting stone.\textsuperscript{17}
Ancient Egypt’s Royal Tombs

The Egyptians built a vast number of tombs over their 3,000-year history. Most of the royal tombs had been looted long before excavations of the nineteenth and twentieth century. Nonetheless, there is a long history of what a royal Egyptian tomb looks like. The best source of which is the Valley of the Kings, as well as the aforementioned mastaba fields of Giza. What can be ascertained from these examples is that the tomb was designed as a house-like structure and decorated par excellence. They have hallways and chambers with level floors, and steps for ease of use in the same way that the earlier mastabas were sectioned off in house-like fashion. According to King Tutankhamen’s tomb, the only non-looted royal burial so far discovered, the Egyptians filled the burial chamber with the deceased’s possessions. For that reason, the tomb really was designed to be the ‘house’ of the deceased.

As for the pharaoh being a god, such an interpretation of Egyptian culture is too simplistic, given the vast amount of knowledge and the complex way in which their beliefs were expressed and disseminated. Nor does the pyramid-tomb match their social structure, technically or artistically. Although it can be misinterpreted in such a way, the word pharaoh does not translate literally into English or any other language as ‘lord’ or ‘king.’ The word Pharaoh is from per aa, which means “Great House.”

Egypt was governed as a theocracy. However, the application of the western concept of theocracy results in a confusing amalgamation of primitive mythology, which is not consistent with the evidence of civil greatness Egyptian society achieved. Nor does it explain the ancient Egyptian understanding of Theurgia, or works of the divine.

The reasons why the ancient Egyptian civilization was so successful for so long also has to be answered. Nowhere in history is there a record of a tyrannical regime and its culture that lasted for very long. Look at all the empires that came and went during the course of pharaonic Egypt – Sumerians, Assyrians, Hittites, Babylonians, Greeks, and the Romans, just to name the more historically significant ones. Egypt’s success lays in their technical prowess, as well as philosophical justice. One of the more noble aspects of Egyptian society is that women had equal rights. They could own property or demand a divorce if they so choose. It is the same reason why a five billion dollar mausoleum for a pharaoh makes no sense whatsoever.

Why the Egyptian Tomb had to be a ‘House’

The ancient Egyptian ritual of mumification and burial has long been a subject of fascination in the western world. With the 1922 discovery of King Tutankhamen’s tomb, it was apparent that the ancient Egyptians not only spent a great deal of effort in preparing the body, but the inside of the tomb as well. They filled it with numerous personal possessions.

For us, it makes little sense to bury so much wealth with the deceased, as opposed to being handed down to an inheriting generation. The common interpretation of the ancient Egyptian burial practice was that the deceased needed all these things in the afterlife. However, such rationale is based on a superficial understanding of ancient Egyptian beliefs. Ancient mortuary texts provide an answer. It was the hope of the ancient Egyptian not only to transcend terrestrial life, but to achieve immortality as a heavenly star. Their fear was that the deceased’s Ba would not be able to join with their Ka in the afterlife, and if the body was allowed to disintegrate their essence would disappear and be absorbed into the energy field that is the fabric of Nature. To prevent this unfortunate event the deceased’s body was mumified.

For the ancient Egyptians, the two most important concepts concerning the afterlife were the Ka and the Ba. Although not an exact analogy, the Ka and the Ba are what the western religious tradition might refer to as spirit and soul. A third factor, ankh, represented immortality. The Ka was believed to be the part of the man’s consciousness (his personality and inner qualities) that related to the immediate world. The Ka was that part of us connected to the physical body; where it lived, its
possessions, as well as the people he or she associated with. The Ka was the energy or spirit that emanated from the person. The Ba represented the part of consciousness that is immortal, the eternal force that causes all of Nature to exist.

In order for the Ka to be reunited with the Ka upon burial their possessions were gathered together by the family and placed in the tomb along with the body. Food offerings to the Ka of the deceased were also interned with all the other goods. When the Ba and Ka were joined in the afterlife, ‘ankh’ would result as the fully resurrected and glorified essence of the deceased, reaching beyond the limits of an earthly realm thereby achieving immortality. For this reason, the tomb was referred to as the Per Ka (house of the Ka) and the priests, who were in charge of it, the ‘priests of the Ka,’ and why the temple was called Per Ba (house of the Ba).

Upon death, the Ka is separated from the body and naturally seeks a means to take form again. However, if that person harbored regrets or violent desires, the Ka would seek “any substance whatsoever, psychic in particular, borrowed from a living being, in order to return to a ghostlike shadow-existence.” Only if the Ka were able to unite with its Ba would the individual person have a continued existence through the unity or ‘oneness’ with its Ba.

The Ba, the animating spirit of Nature, manifested as physical form in Man and was the source of a person’s Ka, separate yet unified in one’s physical form. For this unity to continue into the next life, the Ka would have to be transformed in the tradition of Osiris, whose essence was reincarnated as his son, Horus.

With the understanding of the purpose of the Egyptian tomb throughout dynastic history, that it was designed to be a ‘house’ for the deceased, the Giza pyramids, and in particular the Great Pyramid, certainly does not qualify as tombs. Their passageways and chambers were not constructed for human use in its representation of the pharaoh’s home, nor in order to accommodate the burial rites that occurred at the time of burial. Nor was it haphazardly planned, but designed and built to pre-ordained specifications to serve a specific purpose that had nothing to do with anything mystical. According to German engineer Rudolf Gantenbrink, who pioneered the exploration of the shafts in the Queen’s chamber:

They did not embark on a reckless building spree but that the structure was already carefully planned before work commenced, with the consistent application of expertise that was still relatively simple for the period.

Indeed, for the native African author and intellectual, Cheikh Anta Diop, the Great Pyramid did not represent the “groping beginnings of Egyptian civilization and science, but rather the crowning of a culture that had attained its apogee and, before disappearing, probably wished to leave future generations a proud testimonial of its superiority.”

Tomb Theory Origins

So, why is the tomb theory consistently and veraciously maintained? The short answer is that it has been a tradition for a very long time with an entire discipline resting on its prevalence. Like all ancient Egyptians who turned Giza into a cemetery, Sir William Flinders Petrie could not find a reason to believe the pyramids were anything but tombs. Why? Given the knowledge of history at that time there was no other reasonable explanation. Furthermore, the theory of evolution had become prevalent in academic circles. So, any proper explanation would have to fit the linear pace of evolution. Even Sir William Flinders Petrie could not offer any alternative explanation. He concluded that since all of Egypt’s pyramids were tombs then the Great Pyramid also had to be a tomb:
The Stone at Abu Rawash

In the first place, all the other Pyramids were built for tombs; and this at once throws the burden of proof upon those who claim a different purpose for the Great Pyramid. In the second place, the Great Pyramid contains a coffer, exactly like the ordinary Egyptian burial coffers of early times; like them both in its general form, and also in having grooves for a lid, and pin holes for fastening that lid on. Very strong evidence is therefore required if we would establish any other purpose for it than that of receiving and safeguarding a body.22

Yet, in as much as Petrie gave in to the tomb theory he had his reservations: “It will be well, while discussing theories, to consider how the Tombic theory of the Great Pyramid stands affected by the results of accurate measurement and examination. What evidence, then, has been produced?” He puts forth thirteen inconsistencies from his observations and measurements with the tomb theory.23

1. That Khufu was not buried in the Great Pyramid, according to Strabo.
2. That the passages are well defined, and would lead explorers straight to the chambers, instead of concealing them.
3. That the coffer could not be taken in with its lid.
4. That the coffer is unusually deep.
5. That the grooves are not dovetailed to hold a lid on (since retracted).
6. That no lid has ever been seen.
7. That in no other case is a coffer devoid of ornament or inscription.
8. That “in no other case are the neighbouring walls and passages of the Pyramid so devoid of hieratic and every other emblem.”
9. That the upper passages are unique, and also the above-ground place of the coffer.
10. That the coffer is not built around to protect it, as others were.
11. That the chamber has ventilating channels.
12. That the lid might be a later addition to the coffer.
13. That the coffer has certain cubic proportions, which show a care and design beyond what could be expected in any burial-coffer.

Petrie was able to explain away most of the thirteen points he sighted and in the end decided that “the damaged remains of this theory of accurate proportions, and the fact of the upper passages and air-channels not being known in other Pyramids, are then the only evidences which are left to reverse the universal rule of Pyramids being tombs, and coffers being intended for coffins.”24

Even before Petrie was born the tomb theory was the dominant explanation. In the 9th century the Arab historian al-Mas‘udi, the “Herodotus of the Arabs,” wrote that in 873 BCE an aged Copt insisted that the Pyramids were the tombs of ancient kings and that the king’s body was placed in a sarcophagus of stone and the pyramid completed around the sarcophagus. The entranceway to the pyramid was placed beneath the pyramid itself. According to the Copt, the pyramid was built in stages and then polished from the top down.25

Even further back, during the height of the Roman Empire, the Greek and Roman historians, Diodorus (c.90 – c.30 BCE) and Strabo (64 BCE-24AD), also believed that the pyramids were tombs. But other ancient historians, such as Pliny, claimed that the pyramids were generally understood to be a treasure vault and a way to give the people something to do. The first western historian, Herodotus (c.490–c.425 BCE), also had written that the purpose for the pyramid was a tomb.26

However, the writings put forth by ancient historians have always been suspect, particularly in the case of ancient Egypt. Some scholars such as Thomas Africa believe that “Nationalist priests idealized their roles in antiquity and in the Saite era and provided Diodorus with an account of Egyptian society which was a blend of Ptolemaic reality and sacerdotal wishful imagery.”27 Aristotle, in his Poetics, makes it unclear whether he believed Herodotus but states that his Histories were actual histories as opposed
to poetry since “it is not the function of the poet to relate what has happened, but what may happen - what is possible according to the law of probability or necessity,” and added that “the work of Herodotus might be put into verse.” But in the same sentence states that Herodotus’ works “would still be a species of history.”

What the truth is about Herodotus’ writings we may never know, but what can be said, with confidence, is that the pyramid tomb theory has been in existence for at least two thousand years, and may even reach back to early dynastic times. However, there is no way to tell what really happened. The only conclusion that can be made is that the pyramid tomb theory is tied to western history and its view of the ancient world. The origin of the tomb theory, it seems, rests in the hands of Herodotus.

Tomb Theory Problems

According to the tomb theory, pyramid construction began during the First Dynasty in Sakkara ten miles south of Giza where Djoser converted his mastaba into the Step Pyramid. A number of years later at Dashur, five miles south of Sakkara, pyramid development continued with limited success in the ‘Bent’ Pyramid, and finally with complete success in the Red Pyramid. The Red Pyramid, two-thirds the size of the Great Pyramid, named so because of its reddish color, was the first true pyramid according to the tomb theory. With construction techniques now fully developed, a new site was chosen at Abu Rawash for pyramid building. But a third of the way into its construction the decision was made to abandon it in favor of the Giza Plateau.

However, there are a number of inconsistencies and questions with this approach:

- After the Step Pyramid, other Old Kingdom pyramids built at Sakkara were adorned with hieroglyphic inscriptions, The Pyramid Texts, but the other pyramids, from Abu Rawash to Meidum, contain no inscriptions of any kind.

- The interior design of the Great Pyramid has no precedent or antecedent in Egyptian civilization, or any other civilization.

- During the millennium following the Fourth Dynasty, the Egyptians built nearly one hundred smaller pyramids. However, they used a different method of construction, resulting in structures of substandard quality when compared to the Giza pyramids. Today, these later pyramids are in a state of severe deterioration.

- According to today’s construction techniques it is not possible to build a large Egyptian style pyramid. This is supported by the fact that all attempts to build using the same methods as the ancient Egyptians have failed. So, based on these experiments it is not possible to build large pyramids solely with manpower and simple tools. Thus, the ancient Egyptians did not possess the technology required to build large pyramids.

- If simple hand tools were used to cut and shape stone the pyramid builders would have needed tens of thousands of chisels and hammers. Why have only a few been found?

- Royal tombs throughout Egyptian history show a tradition of house-like of interior design, such as mastabas during early dynasties, and burials in the Valley of the Kings in later dynasties. The Pyramids were a temporary departure from this tradition. Why?
The Stone at Abu Rawash

- Old Kingdom royal palaces have never been found. If a civilization could build such enduring structures as the pyramids why couldn’t they or didn’t they build royal palaces for their Pharaoh with the same vigor?

Figure 7.3 The Red Pyramid at Dahshur

Figure 7.4 The Bent Pyramid at Dahshur
Given these problems associated with the tomb theory the possibility exists that the large pyramids built along the western banks of the Nile River already existed when the earliest predynastic peoples began settling in the Nile Valley. Not knowing what the pyramids were, and recognizing that they were closed structures, they assumed they were tombs. As such, they settled in the areas where pyramids were built turned pyramid complexes into cemeteries. At Giza, they buried their dead underneath mastabas to the east and west of the northernmost pyramid, as well as between the Valley Temple and the middle pyramid and to the south.

This area west of the Valley Temple and East of the middle pyramid is best described as a field of small rolling limestone bluffs buried in a field of yellow sand. Throughout this area are numerous tombs have been cut into the natural limestone formations. The evidence of chisel marks is clearly visible within the tunnels that lead to the crypts, as well as the crypts themselves. Although there are some finely carved tomb entranceways, the dominating character of workmanship is simple and crude. In contrast to the workmanship of the structures and structural ruins on the plateau these workers here certainly used simple tools.

![Figure 7.5 Rock-cut tombs at Giza between the Valley Temple and the middle pyramid](image-url)
Figure 7.6 Rock-cut tombs at Giza between the Valley Temple and the middle pyramid
A Tomb of Assumptions

Figure 7.7 Chiseled statues outside a rock-cut tomb at Giza
The Stone at Abu Rawash

The theory that the pyramids and temples already existed prior to dynastic Egypt solves a number of inconsistencies. It provides a motive for Djoser to modify his mastaba into a step pyramid, and for the early dynastic kings to inscribe their religious convictions into the Sakkara pyramids. They were patterning their tombs after what they thought to be tombs at Giza, which they believed to be the tombs of their ancestors. It explains why pyramids built before and after the third and fourth dynasties were of a lesser quality. Old Kingdom pharaohs were copying the Giza Pyramids, but had no choice except to use simple methods and tools.

This patterning of dynastic tombs from the large pyramids also helps explains the temple architecture on the Giza Plateau. The Sphinx Temple and the Valley Temple, which was built in granite, were built from large, rectangular blocks and are not inscribed with any hieroglyphs or other markings. Referred to as Cyclopean this style of architecture, which is what is found in Abydos at the temple known as the Oserion, also supports the theory that these structure were already present at 3000 BCE. Today, the Oserion lies fifty feet below the level of the temple next to it, which was built later during the middle dynasties.
8 - A History Forgotten

Despite orthodoxy influence in the media, there have always been researchers who have questioned the evidence for the tomb theory in a critical but logical manner. During the 13th century, Abd al-Latif al-Baghdadi observed that the pyramids “illustrate man's intelligence, and the pure genius that has been expended on their construction, and that the sciences, geometry and engineering have been brought to the highest pitch in them.” More importantly, according to al-Baghdadi, they tell us about the people who built them and “their science.” During more recent times, the most important critical view of the tomb theory came from one of Napoleon's surveyors, the French cartographer and engineer Edmé-François Jomard (1777-1862).

Jomard, who was a member of Napoleon’s team of scientists in his 1798 expedition to Egypt, devoted most of his life and of his work to understanding ancient Egypt. In 1803, he helped establish a catalog of hieroglyphs and during the next five years helped draft the famous French publication of Description de l’Egypte. He was also the first man to deduce the geodetic (mathematical and measurement based) origin of the Greek linear scale. Furthermore, from classical texts he was able to determine that the ancient Greek stadium (600 feet) was equivalent to 185 meters that surveyors later discovered was a repeating distance between important ancient sites.

Jomard also deduced that the stadium was one tenth of a minute of the meridian degree, and since ancient authors believed that the apothem (perpendicular distance from the center to any of its sides) of the Great Pyramid was intended to represent this length it must have been deliberate. He also understood from ancient texts that the base of the Great Pyramid was half a minute of a degree of longitude, so 480 times the length of the base equaled one degree.

Ultimately, in Jomard’s eyes, the Great Pyramid was a structure base on geodetics. In other words, the pyramid builders had the necessary astronomical, geographical, and geodetic skills to accurately measure the meridian degree, and since they had that knowledge they could also measure the dimensions of the earth. “He became convinced that the Ancient Egyptians must have had an accurate knowledge of the earth’s circumference and based their units of linear measurement upon it.” For Jomard, the Great Pyramid was a repository of measure, a testament to a civilization. It was not a tomb but a shrine of advanced skill and knowledge.

However, there was a serious problem with Jomard’s findings. If his insights were correct then the Greek linear scale was not Greek at all, but Egyptian and very old. This infers that the Egyptians held a superior knowledge of which the Greeks were unable to learn and preserve. It was also a conflicting paradigm that amounted to academic heresy. According to historian Martin Bernal, “differences between this heterodox school and academic Egyptology became sharp after the discipline’s establishment in the 1860s, and acute in the 1880s after it accepted the dominance of Classics.”

Egyptologists focused mainly on linguistics and ancient Egyptian written material. According to Bernal, they were primarily philologists. However, alternative researchers were “mathematicians, surveyors and astronomers.” These two groups of researchers both with interests in ancient Egypt would never mix, and with the backing of the university system in their favor the Egyptologists would never have to refute technical arguments that they were unable to follow anyway. But the heart of the struggle between these historical paradigms was even darker. According to Bernal:

The struggle was unequal from the start, for the heretics were fighting against the two principal paradigms of the 19th century - ‘progress’ and racism. If they were right, an ancient African or semi- African people had had better mathematics than any European until the 19th century itself.
In dealing with the orthodoxy for the public’s opinion the major problem for the alternative research (and this is just as much true today as it was a hundred years ago) was that it lacked organization. Legitimate, methodical approaches even though valid in their approach and conclusion could be easily lumped into much more subjective, fanatical and ‘faith-based’ ideas. Another factor was that Classic studies and linguistics was more prestigious than other disciplines, notably mathematics. With the help of renowned science historian Otto Neugebauer, who demonstrated significant Mesopotamian influence on Greek mathematics and astronomy and insisted that the Egyptians had no original or abstract ideas, the orthodoxy had all the ‘scientific’ weight that it needed.\(^5\) Anyone claiming that the Great Pyramid was anything other than a tomb was a ‘pyramididiot,’ although, interestingly, Neugebauer shied away from theories on pyramids. Opposing theories regardless of their merits were effectively debunked with very little effort. Precision and other uses of pi or phi were practical knacks and not profound thought. Over time, a more politically correct word came into use, ‘pseudoscience,’ but it carried the same insult.\(^6\)

Nonetheless, a few scholars such as astronomer Sir Norman Lockyer risked their careers by confronting the evidence. Lockyer, whose mind was boggled over the mathematical elegance of Egyptian structures, claimed that they had been very carefully built for astronomical purposes.\(^7\)

Since Lockyer’s days other men have joined the ranks of the scientific heterodoxy, most notable the French philosopher René Schwaller de Lubicz. Although Schwaller de Lubicz was never officially part of the academic establishment, his exhaustive research during the 1940s of the Temple of Amun-Mut-Khonsu, its measures and its geometry, was a landmark event. Although rhetorically abused, in more than sixty years his work depicting a sophisticated philosophy of science, and the application of that science into architecture, has never been refuted.

There is also Harvard academic Livio Catullo Stecchini who, during the 1950s and 60s, plausibly showed that the ancient Egyptians had a precise knowledge of global measurement that was applied in other areas besides Egypt with extraordinary precision. More recently, in 1969, one of the great Renaissance historians, Giorgio de Santillana, along with Hertha Von Dechend bucked the system with *Hamlet’s Mill*; a seminal and scholarly book loaded with historical evidence that ancient myth was nothing less than a scientific language with its origin dating to sometime before 6000 BCE.\(^8\)

Today, valid scientific attempts at understanding why the Giza pyramids, and particularly the Great Pyramid, were built and what they may have been used for are generally ignored, particularly when they contradict archaeological and Egyptological interpretations of history and purposes of the Pyramids. Why this is so is because any serious scientific effort into the possible function of the pyramids delivers evidence contradictory to the orthodox explanation. Furthermore, by engaging in intellectual discussion with them the orthodox arguer begins to resemble them since many alternative arguments are based on logical deduction and mathematics.

For example, French architect and archaeologist Jean-Philippe Lauer (1902-2001) who spent many years studying the Sakkara pyramid complex, engaged non-tomb pyramid theories. Although he denounced any ideas attributing the purpose of the pyramids as anything else that a tomb, “he admitted that the measurements do have some remarkable properties; that one can find such relations as pi, phi, the ‘golden number’ and Pythagoras’ triangle from them; and that these generally correspond to what Herodotos and other ancient writers claimed for them.”\(^9\) Lauer believed that the Greeks were the first true mathematicians, but some ancient texts and traditions, such as Iamblichus’ *Life of Pythagoras*, contradicted this stating that a large number of Greek philosophers, astronomers, and mathematicians studied in Egypt. In dealing with this contradiction Lauer wrote that:

> Even though up to now no esoteric Egyptian mathematical document has been discovered, we know, if we can believe the Greeks, that the Egyptian priests were very jealous of the secrets of their science and that they occupied themselves, Aristotle tells us, in mathematics. It seems, then, reasonably probable that they had been in possession of
an esoteric science erected, little by little, in the secrecy of the temples during the long centuries that separate the construction of the pyramids, towards the year 2800, to the eve of Greek mathematical thought in the 6th century BC. As far as geometry is concerned, the analysis of buildings as famous as the Great Pyramid would take a notable place in the researches of these priests; and it is perfectly conceivable that they could have succeeded in discovering in it, perhaps long after their erection, chance qualities that had remained totally unsuspected to the constructors.\(^10\)

And...

For the whole length of the 3,000 years other history, Egypt thus, little by little, prepared the way for the Greek scholars who - like Thales, Pythagoras and Plato - came to study then even to teach, like Euclid, at the school in Alexandria. But it was in their philosophic spirit, which knew how to draw from the treasure amassed by the technical Positivism of the Egyptians, that geometry came to the stage of a genuine science.\(^11\)

In the face of contradiction Bernal sees it difficult to see “why he [Lauer] should then baulk at the simplest solution, believe the Greeks and accept, with the German Egyptologist Professor Brunner, that there was an Achsenzeit or ‘axial age’ around 3000 BC;” this ‘axial age’ of sophisticated knowledge of mathematics being consistent with the traditions of later Egyptians which were told to visiting Greeks. Bernal believes there is nothing to back the hypothesis that the Greeks achieved a qualitative intellectual breakthrough (the so-called Greek Miracle) during the 4th century BCE that approximated the actual achievements of the Pyramids. He agrees with the ancient model of history, that ancient Egyptians had a tradition of superior mathematics.\(^12\)

Martin Bernal with his three volume work *Black Athena* has finally raised the issue of historical accuracy with the academic view of the ancient world, in particular ancient Egypt. However, despite the brilliance of daring scholars who have challenged orthodox views the most important questions are yet to be answered.

**The Problem of the Dynastic Race**

Although the dynastic race theory has lost its flavor with Egyptology the reasons why nineteenth and twentieth century Egyptologists favored an extra-African origin for dynastic Egypt was based on evidence. Petrie found few artifacts that could be dated to a period before the fourth dynasty. In his memoirs *Ten Years Digging in Egypt* Petrie noted that “the civilization that we find before us in the earliest known history appears elaborate and perfect.”\(^13\) After that he commented that changes in taste and custom occurred slowly after the first few dynasties. For Petrie, this earlier culture were not just masters of the arts but were “also of combined labor, of masonry, of sculpture, of metal working, of turning, of carpentry, of pottery, of weaving, of dyeing, and other elements of a highly organized social life.”

At Meidum, twenty miles south of Giza, Petrie found burials of what he viewed as two separate Predynastic cultures. The more recent culture buried their dead with the body at full length, of which Petrie attributed to nobility. The older culture buried their dead with the knees curled up to the nose and lying on their side facing east with their heads to the north. Petrie interpreted the Meidum cemetery as a place where not only two separate occupations occurred but two separate races. The earlier culture he assumed to have been the leadership and the driving force for the fourth dynasty. He called this unknown culture the ‘dynastic race’ and assumed that they could not have been from Africa, in synch with the social and political thinking of the day.

At Naqada, he found the same scenario, and unearthed twenty-one hundred graves containing an assortment of clay pots, palettes, and various amulets made of stone, bone, and ivory and attributed
them to a period of time between 4000 and 3100 BCE. Petrie concluded that life before the pharaohs was primitive, and, in the years preceding dynastic times Egyptian culture suddenly evolved. For Petrie, the best explanation of the evidence was that “a great European confederacy” invaded the Nile Valley multiple times – “Greece, Asia Minor, Italy, and Libya, all leagued together.” Thus, the grand Egyptian civilization of monuments, obelisks, and temples was the result of an “incoming race” who found a native population with beliefs and customs very different from their own. For Petrie, at Meidum these two races, one aboriginal and the other from abroad, had not yet mingled.  

At that time, diffusionist theories of superior cultures and the spread of civilization to indigenous peoples were popular among Western Europe’s colonial powers. During the early part of the twentieth century fascism was fashionable. Thus, diffusionist theories of a superior race were popular. Furthermore, Africa was known as the “Dark Continent” and thought to be incapable of producing an advanced culture.

Later, the dynastic race theory shifted to the Mesopotamian Valley and invaders from the East. In this modified version, culturally and politically superior Mesopotamian quickly established themselves as rulers over the primitive Egyptians. Continuing excavations appeared to bear out this theory. Skeletons more robust than the typical ancient Egyptian and exhibiting a dolichocephalic (oblong) shaped skull were discovered and believed to be the evidence that a dynamic race existed. In late Predynastic graves of Upper Egypt’s northern part also produced skeletal remains of an unusually large size. According to Walter B. Emery (1903-1971), who specialized in archaic and predynastic Egypt, the difference between these skeletons and the typical ancient Egyptian skeleton are so distinct that the suggestion these people are derived from earlier peoples is impossible. One dolichocephalous skull from a third dynasty ruler, found in 1902 in a mastaba in Beith Khallaf, belonged to a man whose height was six feet, two inches. It may have been the remains of King Sanakht, whose name was found in the tomb.

According to this Mesopotamian dynastic race theory, Egypt’s pharaonic class entered the Nile Valley from the east since royal art from the first dynasty was similar to that found in Mesopotamia. During the 1930s, the German explorer Hans Winkler advanced the theory by discovering ancient rock art in the Eastern Desert. Between the Nile Valley and the Red Sea Winkler found numerous images of boats similar to those found in early Mesopotamian art. He argued that Mesopotamian invaders used the Red Sea to access to Egypt, and as they made their way to the Nile River they left their marks on the rocks. Other evidence also seemed to support such an idea. Carvings on an ivory knife-handle from Gebel-el-Arak were believed to be Mesopotamian or Syrian, and paintings on the walls of a late predynastic tomb at Hieraconpolis also suggested invasion. Hieraconpolis’ tomb and the knife handle displayed Egypt’s native ships and strange vessels with a high prow and stem, unmistakably Mesopotamian in origin.

However, there were problems with a Mesopotamian invasion by sea. Winkler’s ‘Egyptian boat’ rock art was dated to be older than its Mesopotamian counterparts by many centuries. And in 1969, archeologists from the American Museum of Natural History discovered a settlement that closed the book on the dynastic race invasion theory.

While excavating outside Hierakonpolis near the ancient city of Nekhen the American archeologists discovered the remains of an entire Amratian village along an ancient dried-up creek bed which led to the reconstruct of the predynastic daily life. The Amratian village was composed of farmers and craftsmen whose leaders managed the manufacture and trade of the goods. It was also evident that these predynastic Egyptians began to build simple irrigation systems and were developing a written language. As time went on their tombs became larger and more sophisticated eventually becoming similar to the tombs of the early pharaohs. For Egyptologists, the excavations at Hierakonpolis proved that a dynastic race did not invade the Nile Valley.

Despite this critical blow to the dynastic race theory, the evidence for Egypt and Mesopotamia remains, and is not trivial. It is extensive and cannot be explained by casual trade. Cylinder seals of Mesopotamian origin found in Egypt dates to between 3500 and 2900 B.C. According to Pennsylvania
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State University Professor of Classics and Ancient Mediterranean Studies Donald Redford, “It would seem that besides trade items, a human component of alien origin is to be sought in the Gerzean (prehistoric) demography of Egypt. This is not to resurrect the moribund ‘dynastic race’ theory, but we should be careful not to misread the evidence or ignore its real weight.”

For Redford, this ethnic duality of ancient Egypt existed long before 3600 BCE.

Although little is said today concerning what this “ethnic duality” is, prior to 1965, and particularly during the first half of the twentieth century, this “ethnic duality” was carefully studied in the shape and size of human skeletons and in particular the shape of skulls. In 1905, Egyptologists Douglas Derry and Elliot Smith systematically examined and measured numerous skeletal remains unearthed on the Giza Plateau cemetery by George Reisner, graves consisting of “pits of varying depth hewn in the limestone and with a side chamber.” Today, there is little left in the way of human remains in the cemetery around Giza’s pyramids but when first excavated they proved to be a valuable source of predynastic and early dynastic Egyptians.

According to Derry, predynastic and early dynastic burials were performed with the deceased in a contracted, fetal position – just like Petrie noted. But around and after the fourth dynasty burials were performed with the body in an extended position. There was also a significant difference in skeletal types suggesting that, in conjunction with burial practices, over the years a new population began mixing with an older population.

In 1909, Nubian excavations provided numerous human remains from the southern regions of ancient Egypt that could be compared with the remains form northern Egypt. After comparing the two sets of data, skeletal measurements from Giza and Nubia, it was clear to Derry “that the pyramid builders were a different race from the people whose descendants they had hitherto been supposed to be” assuming that the early dynastic individuals entombed at Giza did in fact build the pyramids, and that “quite definitely they [predynastic and early dynastic peoples] had not come from the south as the Dynastic people were far removed from any negroid element.”

What Derry and others Egyptologists such as Cicely Fawcett, Geoffrey Morant, Arthur Thomson, and David Randall-Maclver had determined through the comparison of human remains was that there were essential differences between the crania of Predynastic and Early Dynastic Egyptians, a distinction that gradually disappeared later on as the two peoples mixed. The Predynastic people had narrow skulls with a height measurement exceeding the breadth, a condition common also found in native Africans. However, the reverse was the case for the Dynastic Race. They not only had broader skulls but the height of their skulls, while exceeding that in the Predynastic Race, was still less than the breadth. In other words, the ‘dynastic race’ had larger heads, which, for Derry meant larger brains.

For both sets of human remains there is little difference in the length of the skull, but a significant difference in the breadth, 132 millimeters for the Predynastic peoples as opposed to 139 millimeters in the Dynastic Race. Derry viewed this as significant and regarded these measurements as “characteristic” of the two different races. He also drew attention to the work of Hermann Junker during his 1909/1910 excavation at a cemetery called Turah, a few miles from Cairo on the east side of the Nile. The Turah cemetery consisted of late predynastic and First Dynasty graves. But there were also burials from the Third Dynasty. According to Derry, “these skulls exhibited very clearly the inherent differences as between the Predynastic and Dynastic races.”

According to Derry’s findings, the people first buried at Turah were dolichocephalic, but over the years and by the third dynasty they had become mesocephalic. The cephalic index for men grew from 72.3 to 76.2 while the women went from 74.6 to 79.1, almost brachycephalic. (75 and below is considered dolichocephalic, between 75 and 80 is mesocephalic, and above 80 is brachycephalic.) By lumping these figures together and taking the means of the three dynastic measurements (length, breadth, and height), the result, according to Derry, “is so far removed from the mean of Predynastic people that “under no circumstances could they be considered the same race.” Derry also believed that the data indicated the presence of a dominant race or aristocracy, although few in numbers.
Although the data was correct, Derry erroneously concluded that a more intelligent race, those with mesocephalic skulls, brought to Egypt the knowledge of building in stone, of sculpture, carving reliefs, painting, and writing. It was the only way to explain the enormous jump from the primitive Predynastic Egypt to the advanced civilization of the Old Kingdom.

One of the last distinguished Egyptologists to argue in favor of the dynastic race theory was Walter Emery (1903-1971), the chair of the University of London’s Egyptology department.

Emery knew there were difficulties with the dynastic race theory, and that the origins of Egyptian civilization could not be explained by invading Mesopotamians. Even though his peers were favoring other explanations, Emery could not dismiss the theory. For Emery, over the years of excavations and evidence gathering, it was a possibility that more advanced community from an undiscovered area was at least partially responsible for the birth of dynastic Egypt. He believed that another culture whose achievements were passed on to Egypt and Mesopotamia bests explains the common features, and differences, of both Egyptian and Mesopotamian civilizations.

According to Emery, the dynastic race ruled as the elite and performed the dual roles of priests and governmental officials. This leadership mixed socially only with the Egyptian aristocracy. Precisely who this dynastic race was is still a matter of speculation. However, some scholars associate them with who the ancient Egyptians referred to as the Shemsu Hor, the “Disciples of Horus” or the “Followers of Horus.” Even so, the Shemsu Hor was recognized as the dominant sacerdotal caste in predynastic Egypt until approximately 3000 BCE.

At the end of the fourth millennium BCE the people known as the 'Followers of Horus' apparently formed a civilized aristocracy and ruled over the whole of Egypt. The blending of these two races did occur but it was not a sudden event. Throughout Egypt’s Archaic Period the distinction between the civilized aristocracy and the masses, according to Emery, is very marked particularly in regard to their burial customs. It was not until the beginning of the Second Dynasty do there evidence of the lower classes adopting the funerary architecture and mode of burial of the aristocracy.

Still, the difficulty in deducing precisely who the first Egyptians were stems from a lack of evidence. Mesopotamia certainly shows a background of development. Egypt does not. Before the 1960’s, Egyptologists believed the evidence was sufficient enough to theorize that Mesopotamian cultures had a strong influence on the events that led up to the birth of dynastic Egypt.

It’s really a broader philosophical question that historians of all disciplines have debated for centuries. Does civilization naturally form in primitive cultures because a critical stage of development is reached after slow growth, or does some external stimulus from another culture serve as a catalyst?

On one hand a growth in culture towards civilization is really indisputable. Knowledge that is gained by one generation is passed on to the next, and after many generations the culture will most assuredly reach a threshold where it can be considered a civilization. Yet, trade and exploration has always been traits of the human experience, so it is also likely that cultures from different regions had contact with each other. However, to what extent one culture influences another is sometimes difficult to ascertain. What can be said about Egypt and Mesopotamia is that a sharing of knowledge and certain practices did occur. What the difficult question is ‘was Mesopotamia responsible for the birth of dynastic Egypt?’

Although Mesopotamian and Egyptian cultures are treated as separate, diverse civilizations there are indications that Mesopotamia influenced Egypt just before the beginning of first dynasty. The use of cylinder seals to stamp a letter was typical of Sumer and not of Egypt. Yet, cylinder seals have been found in late predynastic graves. In Sumer, mud-brick was used to erect ziggurats and in the earliest large structures in Egypt mud-brick was also used. Moreover, the mud-brick building of the Egyptians appear to be the same recessed niche style that is found in Mesopotamia, and appears suddenly and fully formed in the Nile Valley. But in Mesopotamia archeologists have traced development through various stages.

According to Emery, just because the Mesopotamia was not the source of the dynastic race doesn’t mean that the dynastic race didn’t exist. The rapid advance of civilization in the Nile valley prior to
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Egypt’s unification had to be explained somehow and the best explanation was a core group of people that served as an organizing and governing body. Furthermore, a dynastic race did not have to take the “the form of a horde invasion.” For Emery, although the evidence is clear that Egypt and Mesopotamia held predynastic relations, as in the case of architectural concepts, the Egyptians were clearly superior in their construction practices.

What is believed to be certain is that at the beginning of Egypt’s historic period the country was divided into the two rival kingdoms, one in the North and the other in the South. Both were governed by a royal house and aristocracy of the same race that were traditionally referred to as the ‘Followers of Horus,’ which the historian Manetho referred to as the demigods. Although scholars still debate how the two countries were united, records of the unification found at Hierakonpolis (the ancient capital of Upper Egypt) demonstrate that unification did take place. On two large ceremonial, limestone mace-heads and on both sides of a large palette carved from green schist, the unification is recorded. Both monuments belonged to different kings, yet commemorate the same unification. The ceremonial mace-heads boast the praises of a king known as the Scorpion King, and the palette boast of a conquest led by Narmer, whom Egyptologists identify as the first dynastic ruler, Menes.

When were Egypt’s Pyramids Built?

Given the evidence of a grand civilization built in granite, and the differences in early and predynastic burials recorded by Petrie and Derry, the idea that migrating cattle herders were responsible for dynastic Egypt is unreasonable. So is an invading culture from either Europe or Mesopotamia. Neither of these scenarios explains the evidence, historic or forensic. However, the problem of the dynastic race is solved with a little assumption that the ancient Egyptians were correct in recording the chronology of their kings. The dynastic race that Emery, Derry, Petrie, Winkler, Fawcett, Morant, Thomson, and Randall-MacIver banked their careers on did exist, but they were not invaders or from any other country. They were native Egyptians themselves who had maintained their culture for thousands of years. Their tradition was of great antiquity, the Followers of Horus – Manetho’s demigods; recorded in the Palermo Stone and the Turin King’s List, the Shemsu Hor. According to the ancient Egyptians, they ruled the Nile from 14,800 to 3000 BCE.

Why the dynastic race was discarded as a viable theory was more a result of politics than it was a bad interpretation of the archeological evidence. So was the kings list. In a politically Darwinized world there is no room for any civilization prior to 3000 BCE, even if there is only a hint. Politics may work in a government funded school system, but politics does little to solve an engineering mystery.

Almost as suddenly as ancient Egypt’s engineering genius arose it disappeared. A few hundred years later, construction efforts by the fifth dynasty were at best feeble. In that dynasty structures were erected by piling stone rubble between a building’s outer and inner shells. Ancient Egypt was never again to see the majesty of true pyramid building. Egyptologist John Wilson of Chicago University summed the facts:

The several pyramids of the Third and Fourth Dynasties far surpass later pyramids in technical craftsmanship. Viewed as the supreme efforts of the state, they show that the earliest historical Egypt was once capable of scrupulous intellectual honesty. For a short time she was activated by what we call the ‘scientific spirit,’ experimental and conscientious. After she had thus discovered her powers and the forms which suited her, the spirit was limited to conservative repetition, subject to change only within known and tested forms.

This sudden burst of engineering genius that existed for the few centuries of the third and fourth dynasties makes little sense. What makes more sense is that the pyramids already existed. Such a
scenario best explains all the evidence, which means at one time in the remote past a technically advanced civilization existed.

According to the Egypt Turin king’s list, prior to Narmer the first king of the first dynasty, the Shemsu-Hor ruled for 13,420 years and before them the gods ruled for 23,200 years. This provides the possibility that the pyramids were constructed sometime before 3000 BCE and after 39,620 BCE.

With the biases of our society and educational system this sounds ridiculous. Nonetheless, this is what the evidence presented thus far indicates. For those who earn their living solving real world problems with science and technology, the Great Pyramid speaks for itself.
9 - A Pulse for the Great Pyramid

In a recent documentary entitled “Engineering an Empire: Ancient Egypt” hosted by Peter Weller several renowned Egyptologists appeared expressing the skill and technical prowess of the ancient Egyptians on how they constructed pyramid tombs for the king. I found the title somewhat misleading, however, since no engineers appeared in the show to comment upon the pyramid’s structure, inside or out. Nonetheless, the first hour of the two-hour program focused on Sakkara’s Step Pyramid in a unique and fascinating way. Weller and his camera crew descended into the depths of the Sakkara’s underground tunnels for a rare look at ‘Djoser’s chambers;’ a truly groundbreaking section of film it was. Next was the Red Pyramid at Dashur, supposedly the first true pyramid ever built by the Egyptians.

Anticipating what would be said about the Great Pyramid’s interior I was disappointed when the narrator glossed over the Giza pyramids in a matter of seconds. The documentary’s producer’s decision to skip the Great Pyramid is unfortunate because its interior design with its multiple chambers and mixture of shafts is as mysterious as it gets for any structure built at any time. It is also the most convincing evidence that ancient Egypt’s large pyramids were never tombs.

Despite boards attached to the floor to prevent slipping, walking up the ascending passageway is a quite a task, crawling up really since you have to hunch over. It’s hot and the air is stale from the constant line of tourists moving in and out of the pyramid. And the taller you are the worse it is. I must have hit my head four or five times wanting to relieve the stress on my back. Arriving at the base of the Grand Gallery I could see that the Queen’s chamber was closed. A yellow iron gate prevented anyone from entering. Upon entering the Grand Gallery, now standing and looking up the King’s chamber was a fantastic, eerie site. Still, crawling through the short tunnel from the Grand Gallery into the antechamber and then into the King’s chamber was even more fantastic.

In the King’s Chamber a small group of people are performing an initiation or ritual of some kind around the granite box at the far end of the chamber. The hum of their chant fills the air, which seemed to be amplified by the acoustics of chamber. A lady from Beijing asked me if I speak English. I affirmed so she asked me what they were doing.

Even with low lighting the red hue of the granite walls were visible. Running my hand across the north wall next to the shaft I could feel that the granite slabs that make up the wall were flat but not polished. On the southern wall whatever was attached to the shaft had been removed. A huge piece of the granite wall, in the shape of an oval, was missing. Whatever was used to remove the inlaid object must have been powerful. It looks like the granite was ripped away.

The Great Pyramid’s Internal Design

With its bizarre configuration of internal chambers, passageways, and shafts, the Great Pyramid’s internal design is perhaps the biggest ancient mystery to be solved. Egyptologist John Romer, in considering the Great Pyramid’s design, says its:

…an alien thing, so foreign that some of our most basic modern points of reference – the theoretical point, for example, where the pyramid’s central axis bisects its baseline – are but abstractions in themselves. …From the very beginning of the work, therefore, the pyramid-makers had need of much of the information that a modern building plan provides: a plan that described the harmonics of the Pyramid’s interior architecture and linked them to the Pyramid’s exterior; to its height and width, to the level of its baselines and the position of its central axis. A subtle plan as well, that set a maze of mathematics behind the Pyramid’s smooth exterior.¹
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There is little reason to suspect that so much work was devoted to the creation of three separate chambers, one of which built with granite, simply for the purposes of entombing the king.

It is in the explanation of the Great Pyramid’s interior design where the ‘tomb theory’ is exposed for what it is: an outdated theory based on ancient hearsay, and a very poorly assembled theory - completely unscientific. There is no evidence – circumstantial or otherwise – that the Great Pyramid was designed to be tomb. Egyptology assumes it was a tomb because their entire curriculum has been based on that assumption since the beginning of Egyptology, which is based on ancient anecdotal evidence.

How the strange arrangement of the Great Pyramid’s internal chambers and shafts is explained is even less credible than the tomb theory itself. According to the tomb theory, when the pyramid was being constructed, the king’s burial chamber was originally the subterranean chamber that was cut into the bedrock below the pyramid. However, as construction progressed, the king or his architect decided that it should be moved to another location midway within the height of the pyramid. Later, it was moved again to a third location above the second location, and that second location was then to become the Queen’s burial chamber.

Figure 9.1 Three dimensional view of the Great Pyramid’s interior design

However, the logic in this explanation fails to explain the large passageway, called the Grand Gallery, which forms a magnificent corbel vault ceiling built from enormous limestone blocks in seven layers. The gallery joins the upper chamber to the middle chamber directly beneath it. Interestingly, on both sides of the Grand Gallery are low ramps that run the length of the passageway. Cut into these ramps are twenty-seven square openings, alternating from large to small, at regular intervals that correspond to
right-angled niches in the gallery walls. Their function has been debated ever since their discovery. The prevailing theory is that a wooden structure was anchored in these openings (slots) in order to move construction materials or support blocks while the corbel ceiling was under construction. Admittedly, Egyptology recognizes that, so far, no theory accurately explains the curious slots built into the Grand Gallery’s ramps.

At the lower end of the Great Gallery, a narrow passageway leads to a corridor that descends into the bedrock underneath the pyramid. When discovered, this shaft was filled with rock and sand. Petrie believed it was an escape route for those who lowered the granite blocks into the ascending corridor after the king was entombed. However, if that were true, then the shaft could not have been filled from the top. Another theory explains that it provided fresh air to the men who were excavating the underground chamber, but that would mean that the underground chamber, as well as the shaft were built after the Great Gallery. Common sense techniques of construction, ancient or modern, dictate that foundation and excavation work should be performed first.

Near the entrance of the middle Chamber, the connecting passageway steps down and slopes, overall sixty centimeters, to meet the floor of the chamber. Why this was constructed like this is unknown. According to some theorists, the original floor was granite, and was removed by thieves or confiscated and used in the upper (King’s) chamber.

The Middle Chamber itself is an enigma. Situated precisely on the pyramid’s east-west axis, the room is built out of limestone blocks with a corbelled ceiling and sports a niche four and a half meters tall in its east wall. The purpose of this niche is unknown, but is guessed to be the spot where a statue of Khufu was placed. More bizarre are the narrow shafts built within the north and south walls of the chamber, which were originally tapered (and sealed) to a small hole as the shaft meets the chamber wall.

In order to explain these shafts, one idea is that the Middle chamber was a backup burial chamber for the pharaoh in the event of the pharaoh’s sudden death while the pyramid was still under construction. (The Upper chamber also contains shafts.) After the Upper chamber was completed, the shafts in the middle chamber were sealed.

Finally, there is the Upper Chamber along with its antechamber – more baffling than the main chamber – both are constructed from red granite. The walls, floor, and ceiling are all made of granite. In all, the ceiling of the Upper Chamber is composed of nine slabs of granite weighting four hundred tons each. Above the ceiling are forty-three beams of granite stacked in five rows whose purpose has remained a mystery. It has been suggested that the extra granite was applied in order to support the weight of the pyramid. However, the Middle chamber, being lower in the body of the pyramid, supports more weight than the Upper Chamber, and it was not built with reinforcement slabs. As does the Middle chamber, the Upper chamber also contains shafts in its north and south walls.

Although the prevailing theory is that these shafts were constructed for the purpose of air circulation, it is within the concept of a ‘resurrection machine’ that the shafts find another meaning. The soul of the King would ascend one of the shafts, believed to be astronomically aligned to the constellation of Orion, on his way to becoming a star.

Such ideas, so speculative in their nature, concerning the purpose of the Great Pyramid leave much to be desired. However, a more pragmatic approach, such as a project manager might undertake, and backed by engineering principles, provides better understanding into the design and function of the Great Pyramid.

An Engineering Marvel

Giza’s Great Pyramid tells a story, but not the story of a pharaoh, or king, or anyone in particular. It is the story of an ancient, technical civilization whispered through the evidence of design, material, and
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function. In every passageway, chamber, and wall there is the unmistakable fingerprint of refined craftsmanship and engineering design.

Despite its enormous size, at first glance the Great Pyramid looks simple enough. One stone stacked upon another. But to assume that it is a simple structure designed for a simple purpose because there are no steel girders or elevators is a deliberate discounting of the evidence. With three chambers, eight passageways, and a grand gallery, the Great Pyramid is internally complex and may be, for modern researchers, the largest puzzle box ever built.

The original entrance opens to narrow passage three and a half feet wide by four feet tall, which descends a hundred feet into the bedrock ending in a subterranean room. Although large (46 by 27 by 11 feet), the subterranean chamber appears to be crude, unfinished, and is void of any inscriptions. An ascending passage junctures with a descending passage near the ground level; it is very narrow, four feet high by three and a half feet wide, and rises at an angle of 26½ degrees for 129 feet then levels off into another very small corridor that leads to the pyramid’s middle chamber. Another, very large corbelled chamber off the ascending passage leads to the upper chamber which has been built from slabs of solid granite.

Although its casing stones and outer retaining wall have been removed, as well as any interior equipment if it ever existed, this giant puzzle box remains relatively intact. Explaining what the pyramid was used for - which means explaining every chamber and passageway in a holistic integrated manner - is more than just the Holy Grail of Egyptology. It may be the key to understanding our own history and civilization.

Since there are four chambers designed into the Great Pyramid there are also four keys to analyzing what its function may have been. Each chamber has its own unique character. First, the upper chamber attaches to two shafts, is lined with granite in addition to forty-three granite beams located in a hidden chamber above its ceiling. Second, the grand chamber (gallery), whose ceiling is partially made of granite, is the largest room in the pyramid and leads to the upper chamber. Third, the middle chamber, which is made of limestone, contains a niche in one of its walls and attaches to two shafts. And fourth, the subterranean chamber is located more than three hundred feet into the bedrock, and compared to the rest of the chambers appears to be crude or possibly unfinished.

Of all the chambers in the Great Pyramid the subterranean chamber is the largest as well as the most mysterious. It is fifty-six feet long, twenty-seven feet wide, hewn in the limestone bedrock, and difficult to describe. The descending passageway’s entrance to the subterranean chamber is near the floor at the northeast corner. A six-foot wide square pit shaped like a funnel has been tunneled in the middle of the floor, near the east wall. This square-shaped pit is actually the mouth of shaft eleven feet deep, although the Italian explorer G.B. Caviglia drilled into the pit another thirty feet down in 1816. Today, a handrail has been installed around the pit to keep visitors safe from accidentally falling into it. The western half of the chamber has been carved nearly six feet higher than the eastern half, and sculpted into it are several large fin-like protrusions. All of these fin-like protrusions are situated east to west and are nearly as tall as the ceiling. Between the large protrusions, a stepped channel starts at the floor and flows towards the back of the chamber. In its center there is a channel leading to the western wall. In the southeastern corner a tunnel known as the ‘dead end shaft,’ thirty inches in height and width, runs south fifty-seven feet then ends at a wall. There are two other features in the design of the Great Pyramid that appear to part of the work performed in the bedrock, the well shaft and the ‘grotto.’

If the subterranean chamber were nothing more than a mistake, and was originally designed to be a burial vault then an enormous amount of resources was wasted. On the other hand, if the chamber was an integral part of the overall design of the Great Pyramid and performed a function then what could that function possibly be? The engineers who have studied it claim that its design is similar to an old fashioned pump.

In the latter part of the twentieth century Edward Kunkel, in his book The Pharaoh's Pump, put forth the theory that the subterranean chamber was a hydraulic ram pump that forced water up through the
pyramid and out through the shafts in the upper chamber. Kunkel also believed that water was used to build the pyramid. Stone was carried down the Nile on barges and then through a series of locks built between the river and the construction site. This canal led to a mole that surrounded the Great Pyramid, then being retained by a wall. The subterranean water pump pulled water from the mole into an open, inner area of the pyramid. The casing stones retained the water. (In this theory, the casing stones were set in place before the core limestone blocks.) So, the subterranean ‘pump’ held a dual purpose. First, it was utilized in building the pyramid to flood a series of locks to move stone blocks and when completed it served the greater purpose of pumping water into the surrounding lands.

How the pump works is that air in the subterranean chamber becomes compressed by water flowing down the descending passage. When the air in the chamber can be compressed no more, a check valve at the top of the descending passage closes. The compressed air then forces water up through the well shaft and into the Grand Gallery. To assist this process a vacuum was created in the hidden chamber above the upper chamber though a yet to be determined method of combustion. The reduction in air pressure above the water would then pull water up the grand gallery. A release valve at the top of the Grand Gallery opens and releases the vacuum allowing fresh air in. This causes the water to move down the Grand Gallery. Furthermore, a valve in the antechamber opens, while a valve below the Grand Gallery closes. This moves water into the middle chamber. The air in the middle chamber is then compressed and forces water into the upper chamber where compressed air in the antechamber forces water to the outside through two shafts on the north and south walls.

Although parts of Kunkel’s theory have its problems, such as the placement of casing stones before the inner limestone core stones, he was the first person to recognize a possible hydraulic function for the subterranean chamber. It would be close to fifty years for another mechanically inclined researcher to pick up where Kunkel left off. In November of 2005 a Washington engineer named John Cadman invited Christopher Dunn to his home to see firsthand his working model of the Great Pyramid’s subterranean chamber.
On his trip to Washington Dunn brought along his handheld tape recorder, and recorded the sounds of the pump in action. Gleefully, he smiled as he played the recording for me. *Thump–thump... thump–*
John Cadman’s working model of the subterranean chamber pulsed like a mechanical heart as it pumped water through its pipes.

**John Cadman’s Pulse Generator**

According to Cadman, Kunkel’s idea that all chambers in the pyramid were part of the water pump was a mistake. For Cadman, only the subterranean chamber and its associated shafts were likely a water pump, referred to as a ‘ram’ pump. Furthermore, the full purpose of the water pump was not simply the pumping of water, Cadman theorized. Rather, the heartbeat-style pulse of the water moving through the subterranean chamber created a compression wave that was directed upward to the upper chamber.6

In order to test his hypothesis, first Cadman obtained a number of photographs displaying the features of the subterranean chamber. What he noticed in these pictures was that significant water erosion had occurred in several areas. The most obvious signs of erosion were on the ceiling, proving to him that the pump, at one time, must have been operational. The patterns of erosion also confirm that a tunnel from the pit in the subterranean to the Nile had to exist upon the completion of the pyramid, although now this tunnel has likely filled in with sand and debris.

In front of the subterranean chamber, the antechamber also shows significant erosion on the ceiling. Here, trapped air likely provided space for turbulence and the splashing of water. Furthermore, erosion on the ceiling, which is extensive, are indicative of the patterns flowing water would make, including damage from cavitation as a result of the extremely low pressure rarefaction wave created by the moving water. (Cavitation is the creation of gas bubbles in water because of violent churning.)

There is also significant erosion on the subterranean chamber’s floor. In the step channel, the flow of water ran along the face of the step. As the water enters the step channel its flow was diverted, which would cause erosion. On the subterranean chamber floor the pattern of erosion is matched exactly by water flowing through the stepped channel. There is also significant erosion on the floor, walls, and ceiling that match the step and primary water flows, as well as chipping on the subterranean chamber’s ceiling resulting cavitation. According to Cadman, the rarefaction wave creates a negative pressure wave in the wastegate line which results in cavitation inside the subterranean chamber.7

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Figure 9.5 Standard Hydraulic Ram Pump  
(Courtesy of John Cadman)
Ram pump technology is not new. Our own civilization developed ram pump technology more than two hundred years ago, prior to the invention of electric powered water pumps. How this style of pump functions is through the force of gravity. The ram pump pulls water from a reservoir and moves it to a higher level. From a reservoir, water flows down the input (drive) pipe into the compression (pump) chamber, then out the discharge pipe located at the higher ground level. Some of the water moves out through the waste valve until the velocity of the moving water forces the valve shut. With the waste valve closed, water is no longer able to freely flow into the system. As a consequence, physics demands that the water compresses resulting in a shock wave (or compression wave) originating from the area of the valve. At the same time, the water in the input line reverses direction until the shock wave reaches air (which is enhanced by a stand pipe) while a high pressure surge moves through the output line’s check valve. As the shock wave moves out of the compression chamber, low pressure is created in the system that is equal and opposite the shock wave. This opposing pressure immediately reopens the waste valve and the cycle begins again. The sound associated with the system as it operates is what creates the heartbeat-like rhythm, a pulse: thump-thump... thump-thump...

Although the typical 18th century ram pump was situated above the ground, placing the system underground, as is the case in the Great Pyramid, is a unique application of ram pump technology. According to Cadman, an underground ram pump requires a longer compression chamber in order to allow for waste water output. And, the output line needs to be placed near the compression chamber’s ceiling in order to automatically remove air from the chamber. Furthermore, the stand pipe and output pipe require an exit above ground. Although it might seem unnecessary to build the pump underground, according to Cadman it has its advantages.  

**Cadman Models the Great Pyramid’s Subterranean Chamber**

John Cadman began modeling the Great Pyramid’s subterranean chamber in June of 1999. His first model leaked, and then cracked. Nor would it function. Several months later he began work on a second
model and connected a new line to the bottom of the pit shaft, believing this new line had to be the pressurized output. On New Year’s Eve he had another breakthrough in a theoretical understanding of the correct layout. With renewed excitement, he continued model construction and by April 3, 2000 a working model was finished. It worked on the first try. With this success, he decided to move the model to a seasonal creek with a pond serving as a reservoir. With his working model he began to experiment, and added a straight pipe in order to compare the pumping action with and without a subterranean chamber. What he discovered was that the subterranean chamber absorbed much of the reverse pulse. Without the subterranean chamber the reverse pulse was large and the output flow was more erratic, confirming for him that the output in the Great Pyramid’s subterranean chamber traveled through the ‘dead end shaft.’ For Cadman, it also confirmed his suspicion that the ancient oral tradition is correct. There had to be a tunnel running from the subterranean chamber’s pit to the Nile River.

Cadman also proved that water could be elevated to any part of the pyramid. But what was more of a surprise was when he encased the pump assembly in cement to simulate the effect of being underground. The shock wave from the pumping action was altered into a vertical compression wave! So, the subterranean chamber must have also created a vertical compression wave. This meant that the subterranean ram pump had an acoustical element.

In order to study the acoustics and fluid dynamics of the system Cadman built a second and a third working model. The third model (the acoustic model) weighed five hundred pounds and was placed along the seasonal creek with the small pond as a reservoir. Made of fiberglass and epoxy it was set in a mold then reinforced with cement and rebar in order to withstand the water pressure created by the pump. It was from this third model where the Great Pyramid pump got its name. When turned on the characteristic ‘thump-thump’ of the pump could be felt through the ground twenty feet away, and heard nearly a hundred feet away! Because of the powerful pulses it generated, Cadman dubbed it the ‘pulse generator.’

The fourth model was constructed to study how water moved through the subterranean chamber and could operate in two modes. This model was fitted with twenty-five individual ink injection locations, a glass top, and a glass wall on its east side to view water flow, although Cadman discovered that the glass top quickly shattered when the model was operating in pump/pulse mode. However, when not in pump/pulse mode it was clear by studying the movement of water within the modeled subterranean chamber that the flow was complex and precise. What he discovered was that the sound wave striking the perpendicular surface reflects the majority of the pulse back towards the source. He also discovered that when the fluid jet strikes a perpendicular surface, it spreads in a 360 degree pattern perpendicular to the jet. Thus, he concluded that the design of the subterranean chamber incorporated fluid dynamics as well as acoustical dynamics. In his own words, “The dynamics are on par with that of computerized storm analysis: somewhere between hurricane dynamics and tornado dynamics.”

The importance of Cadman’s work cannot be underestimated because it duplicates the inner workings of the subterranean portion of the Great Pyramid. It is the closest anyone has ever come to demonstrating in an experiment that a technical civilization built the pyramid.

Cadman’s model also revealed some performance issues built into the Great Pyramid’s subterranean pump. An additional ‘assist’ line, from the compression chamber to a secondary location, speeds the movement of water through the output pipe. It also focuses the shock wave in the line leading to the compression chamber. The result is that a pulse in transmitted through the ceiling of the compression chamber. Thus, the line that connects the waste valve to the compression chamber acts as a waveguide forcing the shock wave into a pulse. Therefore, the pulse is transmitted vertically (through the ceiling) while part of the pulse is reflected down the waste valve line. (Design: John Cadman Patent pending)
For the historian, what this model means is that a better understanding of the Great Pyramid as well as the Giza Plateau is now attainable. In its completed state the Great Pyramid required a moat which was fed by a system of aqueducts from the Western Nile (the Ur Nile). An ideal source for a gravity-fed water system since the Western Nile was at a higher elevation than the plateau. It explains the remains of a retaining wall that once surrounded the pyramid. The wall served as an embankment for an onsite reservoir, which in appearance was a moat. Tunnels, such as the ‘well’ at the pyramid’s entrance, connected the Great Pyramid complex to an ancient lake, Lake Moeris, and the Western Nile.

Tunnels beneath the Giza Plateau have always been a source of contention and speculation. According to ancient oral traditions, tunnels linked the pyramids and may have linked Giza to Sakkara. Although there is no proof to validate the extensiveness of these tunnels, shafts leading into the bedrock are a common site on the plateau. Yet, in light of the subterranean chamber being a water pump, the existence of tunnels makes sense and should be investigated further.

It would have to be through tunnels that water was forced into the great Pyramid’s onsite reservoir. As water filled the reservoir, the subterranean area of the pyramid was flooded by water rushing through the entranceway and down the descending passage. When the pump was functioning any access water flowed down the causeway and into the Nile River. This type of configuration was necessary since a constant level of ‘moat’ water was required to sustain a regular and consistent pulse, which was the primary function of the subterranean assembly of chambers and shafts.

According to the ancient oral tradition, a buried tunnel exists that connects the bottom of the pit in the subterranean chamber to the ancient Nile River. Cadman believes that this tunnel was a drain with a
sliding stone plug at its end, the opening and closing of which caused a pulsating action. Where the ‘dead end’ shaft terminates is the back side of a closed check valve, and the tunnel continues beyond.

It is interesting to note that, according to Zahi Hawass, the Giza Plateau was known during New Kingdom times by the hieroglyphic inscription pr osr nb rstw. Pr means place or house and osr means Osiris so together pr osr means ‘the place of Osiris.’ Nb means Lord and rstw means cemetery. However, rstw literally means ‘the underground tunnel’ so during the New Kingdom the Giza Plateau was ‘House of Osiris and Lord of the Underground Tunnels.’ This inscription was found carved into the floor of an underground chamber down the so-called ‘Osiris Shaft,’ located under the causeway that links the middle pyramid to the Sphinx. A tunnel west of this shaft runs about twelve feet toward the Great Pyramid, and at that point narrows significantly.\(^\text{13}\)

It is also interesting to note that on the second level of the Osiris shaft Hawass and his team discovered four pillars and between these pillars were two large granite boxes with their lids removed. Although Hawass dates this level of the shaft to the twenty-sixth dynasty, based on the pottery found there,\(^\text{14}\) it is likely the case that the shaft was part of the pyramid complex’s original design.

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**Figure 9.8 Shafts carved into the bedrock on the south side of the middle pyramid**

According to Cadman, when the pyramid was functioning, the descending passage, subterranean chamber, ‘dead end’ shaft, pit, well shaft, and the grotto make up the components of the Giza pump pulse generator. According to Cadman, it could be operational today if all the tunnels associated with the pyramid could be cleared. Besides the well shaft that connects the descending passage to the middle chamber of the pyramid, there are two other tunnels that would need to be cleared. The pit associated
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with the ‘dead end’ shaft (where the check-valve exists) needs to be cleared. This would expose the horizontal shaft. If these shafts were cleared, the moat reservoir was in place, and the well in front of the pyramid connected a Lake Moeris’ substitute, the pump could be operational.  

One of the most important results from Cadman’s tests was the significance of the well shaft and its effect on the pulse rate of the pump. This specific design issue leads to the intent of the Great Pyramid’s designer.

The well shaft begins near the bottom of the descending passageway and extends upwards 170 feet. In the water pump assembly, the well shaft functions as a stand pipe providing a short cut for the reverse shock wave to reach air. In essence, it maximizes the pulse rate of the pump. Although stand pipes are typically twice the diameter of the input (drive) pipe, in the Giza assembly the stand pipe (well shaft) is actually twenty-five percent smaller than the input pipe (descending passageway), which has a peculiar effect on the system. It lowers the elevation of the pulsing water below the water level of the ‘moat’ reservoir. Interestingly, this specific elevation correlates to the height of the grotto, which serves as a reservoir allowing for stabilization and regulation of the reverse pulse. A block of granite exists within the grotto that fits within the pipe believed to function as some type of choke or regulator.

According to Cadman, the well shaft was part of the original design of the pyramid. As a stand pipe in the pump assembly it served to maximize the pulse rate of the pump and provided an exit for drainage of fluids in the middle chamber. It also reduced the reverse surge out of the descending passage, as well as reduced pumping efficiency and pulse intensity.

Cadman tested four pump configurations, two circulating and two elevating, to gauge the well shaft’s affect efficiency. When in circulating pump mode, the well shaft reduced the efficiency by 29%. And, in an elevating pump mode, the well shaft reduced the efficiency by 68%. The increase in efficiency of the well shaft provided an extra twenty pulses per minute, from sixty to eighty. Since the Giza configuration of the subterranean chamber includes a well shaft, for the builders of the pyramid, pumping efficiency did not appear to be of primary importance. So, if pumping efficiency was not of prime importance then what was?

One way to approach this question is the general layout of the subterranean chamber. The subterranean chamber pit’s is offset by forty-five degrees in relation to the general configuration of the chamber, and is aligned northwest to southeast. According to Cadman, why this is so is that a plane placed at a forty-five degree angle will maintain the uni-directionality and consistency of the compression wave. In other words, this reflective elbow ensures the consistency of the compression wave. Any other type of elbow at the pit’s bottom would diffract (scatter) the compression wave. So, the pit’s alignment is strictly for acoustical dynamics in order to create a standing wave in the waste line and subterranean chamber.

Another way to approach the question is the engineering significance of the ‘dead end’ shaft. It allows for a pressure change which in turn changes the frequency of the compression wave. A gate valve at the end of the ‘dead end’ shaft provides a means for accomplishing this. Adjusting the backpressure by adjusting the gate valve allows for changes in timing. In essence, this is a simple method to compensate for different water temperatures and atmospheric pressure, which are factors that affect the velocity of the compression wave.

Cadman’s testing demonstrated that the pulse rate can be altered by at least thirty percent, between sixty and eighty pulses per minute. He also discovered that adjusting the backpressure changed the water’s density and as a consequence altered the compression wave’s velocity and frequency. In essence, such an assembly allows for easy fine-tuning of the lower portion of the Great Pyramid in order to create a standing wave in the subterranean chamber and wastegate shaft.

These test results confirm that the compression wave was a major design consideration. So, to answer the above question: if pumping efficiency was not of prime importance then what was? According to the evidence, the answer is a compression wave. Of course, this creates another question. Why was a compression wave the primary function of the subterranean shaft and chamber assembly?
Christopher Dunn is like no other mechanical engineer. Not only does he have deep insights into the role of the human experience as it applies technology, but he also has a keen interest in Egypt and Egyptology.

With a lifetime of experience as a machinist, a forty-year career in precision manufacturing, and eight trips to Egypt in the last thirty years, Dunn brought his expertise to bear on why the Great Pyramid was designed in such a way that it has baffled everyone that has attempted to expose its secrets. After twenty years of study his expertise has resulted in the most revolutionary book ever written on ancient Egypt, *The Giza Power Plant*. Because of its conclusions the book has not been well accepted by the Egyptology establishment. Nonetheless, every single chamber and passageway is explained individually and as a whole based on all the available evidence resulting in radical but scientifically sound theory. Every facet of design in the Great Pyramid was built with reason and to perform a function. In fact, *The Giza Power Plant* was the inspiration for John Cadman’s quest to discover the purpose of the Great Pyramid’s subterranean chamber.

Figure 10.1 The Great Pyramid, view from the southeast

Here’s how the Giza power plant worked according to Dunn’s theory. The massive structure of the pyramid collected and funneled tectonic vibrations from the earth below. The Grand Gallery further
The Stone at Abu Rawash

collected these vibrations, and through its resonators converted it into airborne sound. The sound traveled past an acoustic filter, which baffled all but a certain frequency just before entering the upper chamber. In the upper chamber, the filtered sound vibrated the massive granite walls, ceiling, and granite stack above the ceiling, converting mechanical energy into electrical energy.

Since the upper chamber was filled with hydrogen gas produced from the middle chamber, the hydrogen absorbed the electricity, pumping its atoms into an excited state. Microwave signals were collected off the outer surface of the pyramid and directed into the northern shaft leading to the upper chamber. There, the granite box refracted electromagnetic radiation, and, with oscillating crystals adding energy to the microwave beam, served to spread the signal inside the box as it passed through its first wall. Inside the granite box, the spreading beam would then interact and stimulate the emission of energy from the energized hydrogen. Passing through the other side of the box, the microwave energy was then focused into an antenna device, and exited the pyramid through the southern shaft where it could be utilized.

The Purpose of Granite

In the previous chapter we saw how John Cadman provided irrefutable evidence that the subterranean chamber was designed as a water pump to be a pulse generator. Since the compression wave was intentionally directed upwards, towards the upper areas of the pyramid, then it must be the case that either the middle or upper chamber was designed to use such a wave. So, although the middle chamber would be the first room to receive the vibrations of a compression wave there are no clues to how it may have been used. However, the uppermost chamber is not only uniquely and completely made of granite, above its ceiling there are five rows of granite beams stacked one atop another totaling forty-three beams. These rows of granite are separated by spacers so as much surface of the granite as possible is exposed.

Granite is very hard rock and erosion resistant. However, since the upper chamber is already protected by the core of the pyramid what function would require that it be made of granite? More importantly, what properties of granite would react with a compression wave?

Quartz crystal has a peculiar reaction when subjected to vibration. Known as the piezoelectric effect, vibration alternately compresses the crystal thereby producing an electrical signal of high-frequency radio waves. (Microphones, for example, work on this principle.) Quartz crystal does not create energy, but converts it from one kind of energy into another and in effect serves as a transducer. Granite contains anywhere from forty-five to sixty percent quartz crystal. The Aswan granite composing the floor, ceiling, and walls of the upper chamber is fifty-five percent or more silicon-quartz crystal. Based on this evidence the role of the uppermost chamber is likely to have been a transducer in order to produce an electric field from the vibrating granite, which was a result of the subterranean pulse generator’s compression wave.

Although being difficult to believe, the evidence for transduction is compelling. Above the upper chamber in an enclosed area that is accessible only through a hole approximately two feet wide at the top of the Grand Gallery. In this area there are five vertical rows of granite beams. In all there are forty-five granites slabs above the chamber. Forty-three of them weigh up to seventy tons each. Every layer of granite is cut square on three sides, but rough on top, and separated by spaces large enough for a person to crawl into. The result is that each granite beam would vibrate in its own space if subject to a suitable amount of energy. And, if each slab of granite were tuned to the same frequency when one began to vibrate then all others would also vibrate in harmony with the first beam. In other words, all granite beams would vibrate at the same frequency. Furthermore, if the frequency of the source vibration matched the beam’s natural frequency, then the transfer of energy would be maximized.
This explains why the forty-five granite beams above the chamber are rough-cut on one side. Before they were installed above the chamber, stone masons specializing in harmonics removed areas from the granite slabs in order to achieve the desired frequency. In effect, the granite slabs were tuned.

Acoustical tests confirm that the granite beams do resonate at a fundamental frequency. In fact, the chamber itself reinforces this frequency by producing dominant frequencies. Tests performed inside the Upper chamber also reveal that the entire room is free standing from the surrounding limestone masonry.

The granite floor sits on corrugated limestone while the walls are supported from the outside and sunk five inches below the floor. The consequence is that the entire room is free to vibrate at peak efficiency, ready to convert vibrations into electricity. Interestingly, the coffer itself inside the chamber resonates at 483 hertz and in synch with the room itself.¹

In essence, the room was designed to be a resonance chamber. However, assuming the chamber was designed to vibrate then a converter would also be required to transform the compression wave into airborne sound to drive the granite beams and activate their piezoelectric properties.

The Grand Gallery

Key to making the resonance (uppermost) chamber vibrate in the manner suggested is a structure or device that focuses the vibrations rising from the subterranean chamber. Such is the purpose of the Grand Gallery. With its unique angles and surfaces, vibrations are reflected directly from this large hall-like room into the upper chamber. But for this ‘resonance hall’ to work other equipment would be required - equipment that converted vibration into sound. Such a device that would fit into the scheme of the pyramid’s design is a Helmholtz style resonator.
The Stone at Abu Rawash

A Helmholtz resonator is a device that responds to vibrations and maximizes the transfer of energy from the vibration’s source, turning that vibration into airborne sound. This style of resonator is a hollow sphere with a round opening between 1/10 and 1/5 its diameter, normally made out of metal, but can also be made from other materials. The frequency at which it resonates is determined by the sphere’s size, and if in harmony with its source, the resonator acts as an amplifier.

Although no equipment of any kind remains in the Grand Gallery, there are clues that structures of some kind had been installed. There are twenty-seven pairs of slots in the side ramps of the Grand Gallery, which have remained a mystery. They could have contained wooden frames that held a resonator assembly. If so, each resonator assembly would have been equipped with several Helmholtz-type resonators and installed in a series, and tuned to different frequencies. Each resonator in the series responded at a higher frequency than the previous one, thereby raising the frequency of the vibrations coming from the subterranean chamber. To accomplish this, the pyramid engineers would have to make the dimensions smaller for each succeeding resonator reducing the distance between the gallery’s two walls. In fact, the walls of the resonator hall step inward seven times in their height.

At their base, the resonators were anchored in the ramp slots by a wooden frame. Along the length of the wall’s second corbel there is a groove cut into the stone. This may be where the resonators were held in place and positioned as they were installed into the slots. ‘Shot’ pins placed in the groove would have held them in place. Vertical supports for the resonators were likely made of wood.

Finding a resonator in the Great Pyramid would have been a remarkable find. Unfortunately, nothing resembling a resonator has ever been found in the Great Pyramid. However, the Cairo Museum holds some of the most remarkable stone artifacts of ancient Egypt’s civilization. Given the shape and dimensions of some of these vessels, they may have been the Helmholtz-style resonators used in the Great Pyramid. One such item, a bowl, has a horn attached to it. Another bowl lacks handles which are normally part of a domestic vase, but instead has trunnion-like appendages on each of its sides. These trunnions would be needed to hold the bowl securely in a frame. A little-publicized fact concerning these artifacts is that there were 30,000 of them found in chambers underneath the Step Pyramid at Sakkara.

With vibrations from the compression wave moving up the structure of the pyramid these resonators would also vibrate and emit sound which was channeled into the granite resonating chamber. There, the granite ceiling beams would oscillate and spread to the forty-three granite beams above the chamber’s ceiling. All the granite would then resonate in harmonic sympathy. As a result, a maximization of resonance would be achieved and the entire granite complex in the upper part of the pyramid would become a vibrating mass of energy. However, before sound reached the resonance chamber there was some fine tuning to be performed on the sound.

Filtering Frequencies

Between the resonance chamber and the resonator hall there is a small room known as the antechamber. Originally this chamber was believed to hold in place a series of stone slabs that were slid into place after the upper body was entombed in the upper chamber. According to the tomb theory, the half-round grooves in the granite wainscoting supported wooden beams that served as wind-lasses to lower the blocks into place. According to Dunn, the part about blocks sliding into place may not have been far off.

The ancient pyramid builders needed to focus sound of specific frequency into the resonance chamber, which requires an acoustic filter between the resonator hall and the resonance chamber. By placing baffles inside this antechamber, sound waves coming from the resonator hall would be filtered as they passed through. Only a single frequency, or harmonic of that frequency, would enter the resonance chamber. The effect is that interference sound waves would be unable to enter the resonance chamber and to reduce the system’s output.
A Network of Pyramids

To explain the half-round grooves visible on the west side of the antechamber and the flat surface on the east side it must be assumed that these features performed a function. Logically, for a resonance chamber, unwanted frequencies would need to be filtered out. So, a likely purpose for these grooves is that baffles were secured in them. By rotating the cams the off-centered shaft would raise or lower the baffles until the throughput of sound was maximized. Once they were ‘tuned’ the shaft suspending the baffles would have been locked into place in a pillar block located on the flat surface of the wainscoting on the opposite wall.

There are other unusual features of the upper chamber. One is the granite box, partially broken on one corner, the sole contents of the chamber. If a lid to the box ever existed, it has been removed from the room without a trace. Not even portions of a lid, chunks or fragments, have ever been found in any of the passages or chambers. There are also two shafts, each in the north and south wall approximately five feet above the chamber floor. A dish-shaped object was originally fixed into the south shaft that may have been iron plated with gold. (Bits of gold-plated iron were discovered embedded in the limestone near exit of the southern shaft.) Now, there is only broken granite where the object once was.

The granite box inside the resonance chamber is an important component to the system, and most likely occupied a position between the shafts in the north and south walls, although now located at the back of the chamber. However, before the functions of the granite box and shafts can be fully appreciated the middle chamber below the resonance chamber must be addressed.

Creating a Medium for Electron Discharge

The middle chamber, typically referred to as the Middle Chamber, is situated in the center of the pyramid and connects to the bottom of the resonator hall through a horizontal tunnel. Its walls of limestone were sealed with plaster yet its floor was left rough-cut. Built into the far wall of the middle chamber is a corbelled niche with a small tunnel cut to a depth of thirty-eight feet that ends in a bulb-shaped cavern. Its flat, level floor and perfect right-angled left side, surely means it was part of the original construction. Two small ascending shafts, both eight-inch square, terminating five inches from the inside of the north and south chamber walls were discovered by Wayman Dixon in 1872. Although exactly where they lead is unknown, they apparently extend into the upper reaches of the pyramid. Dixon noted that the area of limestone around the shafts were particularly soft.

Another nineteenth century explorer, Piazzi Smyth, deemed it noteworthy to record that white flakes of mortar exuded from joints inside the shaft. Later, it was determined that the flakes were plaster of Paris, also known as gypsum. He also noted that the chamber contained a foul odor that hastened visitors to exit the room. The odor was not likely the result of unclean conditions, but the residual elements of some chemical processes that once occurred there.

In 1993, the German engineer, Rudolf Gantenbrink, found that the shafts are sealed at the ends with a block of limestone. With this discovery, it is clear they were part of the original design and added to the core masonry, level by level, as the pyramid went up. The southern shaft extends more than sixty feet higher than the floor of the upper chamber and runs for eighty-two feet.

In the Southern Shaft Gantenbrink discovered a ‘door’ at the shaft’s end with copper fittings, although it is really a block and not a door. The filming of this shaft by Gantenbrink’s robot, Upuaut, revealed that the shaft’s walls and floor were rough and that lower portion of the shaft exhibited erosion in a pattern of horizontal striations.

Gantenbrink’s robot eventually came to a dead end at the upper part of the Southern Shaft. There it encountered a block of limestone with two protruding and mysterious copper fittings. Although publicized that a hidden door had been found inside the Great Pyramid, the shaft itself is only about nine inches square so it really wasn’t a “door.”
The Stone at Abu Rawash

The copper fittings were theorized as stops to prevent the limestone block from being raised. However, such an explanation eludes construction logic. Why would the pyramid builders want to include a sliding block in an inaccessible area? And even if they did, how was it activated? More importantly, why was the middle chamber designed in such a way that has been described?

A clue to understanding the function of the middle chamber is the two blocked off shafts. Originally, each shaft contained a small hole that connected the end of the shaft to the chamber. The walls of the northern shaft exhibit a dark stain. There is also the weakening of the limestone around the shafts. Another seemingly unexplainable fact is the encrustation of salt on the walls, and the Horizontal Passage in the lower portion of the grand gallery. In some places the salt encrustation is up to a half-inch thick.

The only way that the evidence can be explained is that the middle chamber was exposed to chemicals. One clue to what this chamber was designed for is that salt is a natural by-product of the chemical reaction that produces hydrogen. If this is the case, how salt formed on the chamber walls was through hydrogen gas reacting with the calcium in the limestone.

In 1978, Dr. Patrick Flanagan took a sample of this salt to the Arizona Bureau of Geology and Mineral Technology for analysis and discovered that it was a mixture of calcium carbonate, sodium chloride and calcium sulfate. These chemicals are limestone, salt, and gypsum (plaster of Paris) and are precisely the minerals produced if a hydrogen-bearing reaction occurred in the middle chamber.\(^2\)

Chemical engineer Joseph Drejewski agreed. Under ambient conditions of eighty degrees Fahrenheit, ± 20°, two chemical solutions could be introduced into this chamber to create hydrogen or ammonia. He also agreed that the corbelled niche in the rear wall of the chamber could have been used to house a cooling or evaporation tower. According to Drejewski, zinc is the most frequently chosen metal used to create hydrogen. And when zinc is treated with dilute hydrochloric acid a reasonably pure hydrogen gas is produced.\(^3\)

If the middle chamber was a reaction room other evidence is also explained. Early explorers of these shafts discovered a small bronze grapnel hook, a piece of wood, and a stone ball. For a while these artifacts were misplaced. But, in 1993, they turned up in the British Museum in a cigar box at the Department of Egyptian Antiquities. According to Dunn, what these artifacts may have been is a switching mechanism to signal the need for more chemicals, which also helps to explain the blocks at the end of the shafts.

The copper fittings look like electrodes, and if they were they could deliver an accurate measure of hydrochloric acid solution to the chamber. When functional they would serve as a switch to signal the need for more chemicals. Floating on the fluid’s surface would have been another part of this switch, the cedar-like wood joined together with the bronze grapnel hook. It would rise and fall with the fluid level in the shaft. When the shaft was full, the copper prongs would make contact with the electrodes and close the circuit. As the fluid dropped, the prongs moved away from the electrodes, opening the circuit, thereby sending a signal to pump more chemical solution. Once the hook made contact with the electrodes, the pumping would stop.

The corbelled niche inside the chamber would have provided an anchor for an evaporation tower, and may have also contained a catalyst. The chemicals dilute hydrochloric acid and hydrated zinc chloride, leaked from each of the shafts then pooled on the floor of the chamber. After mixing with a catalyst they would have produced pure hydrogen gas that filled the resonator hall and the resonance chamber.

Why hydrogen gas would be required in this system is that after electrical energy was created there needed to be a medium through which electricity can flow. Otherwise, there is no way to utilize the electrical field formed by the resonating crystals in the granite. With a single electron, hydrogen is the simplest of all elements and would most efficiently absorb energy emitted by resonance chamber’s vibrating quartz. How this works is that hydrogen electrons are induced to increase their distance from the proton, which is an unnatural state. In time, the electrons will return to their normal state and, in
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doing so, release packets of energy. In other words, the stepped-up frequencies entering the resonance chamber would excite the hydrogen gas to higher energy levels. One way to conceptualize this is to envision that the hydrogen electrons move into a higher orbit, ‘puff up’ so to speak, to absorb the energy. The effect is that the hydrogen gas efficiently absorbs energy that is emitted from the quartz inside the granite.

Inside the Resonance Chamber

Although the excited hydrogen will naturally return to its normal state, it can also be forced to return to a normal state through the action of another (input) signal, such as of energy of the same frequency. After reacting with the hydrogen the input signal continues its path and carries away the released energy in the form of a photon. It's within this process of forcing the hydrogen gas to release its excess energy that the granite box and the shafts in the upper chamber were important.

According to Dunn, the granite box could have served as an amplifier of the microwave signal that entered the chamber through the northern shaft. Although densely opaque to us, the granite would allow electromagnetic radiation (invisible to us) to pass through. The granite box could refract electromagnetic radiation as it passed through the box’s north and south walls.

Although accurate measurements for the optical characteristics have not been made, Piazzi Smyth’s measurements did show that the surfaces of box’s ends are concave. So, when the granite box was positioned in the path of the incoming signal from the northern shaft it would spread the signal inside the box, as it passed through the first wall of the box. Inside the granite box, the spreading beam would then interact and stimulate the release of energy from the energized hydrogen. To complete the system what would be needed is a device that could gather and pass the energy beam to the southern shaft leading to the pyramid’s exterior. Such a device likely existed on the southern wall.

At the opening for the southern shaft there is an area that has been ripped out in the general shape of a horn antenna. If a horn antenna was installed in the wall then it would have acted like a microwave receiver. Microwave radiation coming in from the north shaft would pass through the granite box, soak up more energy, and then be focused by the other end of the granite box into the horn antenna.

Why this might be the case is that the northern shaft was constructed to pass through the masonry from the north face of the pyramid into the resonance chamber. With the original casing stones of the Great Pyramid being smooth and dish-shaped they were possibly a way to collect microwaves that exist naturally. Although invisible and harmless, microwaves are constantly bombarding the Earth from space. Collecting these radio waves and focusing them into the pyramid through the northern shaft would have created a waveguide input signal for the resonance chamber. Interestingly, according to Dunn, the waveguide (the northern shaft) leading to the chamber has dimensions that closely approximate the wavelength of microwave energy, which is 1,420,405,751.786 hertz. It is the same frequency of energy emitted by naturally occurring hydrogen in the universe.

This helps explain the gold-plated iron fragments that were discovered embedded in the limestone near the southern shaft’s opening to the exterior. Lining the shafts with gold-plated iron would make it a very efficient conduit for the input signal and the energy output. It also helps explain why thieves tore away the object from the southern wall of the resonance chamber. It also would have been gold plated. Plating the inside of the shaft and the horn antenna with gold would also have been an ideal conductor for the electrical energy, just as gold is today used in instruments where conductivity is important.

Monitoring Energy Production

Finally, there is the Ascending Passage, today’s entrance into the Great Pyramid. It also displays signs of purpose. Because a vibrating system can eventually destroy itself, a control of vibration energy would also be required. One way is to dampen it, and the other is to counteract it with an interference wave
The Stone at Abu Rawash

that cancels out the vibration. Physically dampening the vibration would be impractical, considering the function of the Great Pyramid as a machine. However, dampening would not always be necessary, unlike the dampening needs of a bridge, for example. It would reduce the efficiency of the machine, and likely involve moving parts, like dampeners in a piano. Canceling out excess vibrations by using an out-of-phase interference sound wave would have been a logical choice.

The Ascending Passage is the only feature inside the Great Pyramid that contains granite plugs that are directly accessible from the outside. From a builder’s perspective, if they were simple plugs using granite would have been an over-designed and over-crafted for their use. Limestone would have been sufficient to keep out robbers. So why use granite? There is a very good reason.

These plug-like devices likely performed two critical roles. First, they would provide feedback to the plant operators by responding to sound (traveling through the Ascending Passage) that was generated inside the resonator hall. Second, they may have been able to respond to vibrations from equipment in the descending passage and transmit out-of-phase interference sound waves to prevent vibrations from reaching destructive levels. Of course, the operators would be using attached vibration sensors to the bottom granite plug in order to monitor the energy level inside.

This explains not only the builders’ logic for selecting granite, but also the means by which the ancient operators controlled the level of energy in the system. By directing a signal of the correct frequency up the Ascending Passage, the operators would have been able to prime the system. If so, they would have been part of the pyramid’s original design.

According to Petrie, the adjoining faces of the blocks had a wavy finish (± .3 inches). Some granite was still cemented to the floor, indisputable proof that the granite plugs were positioned, as the Great Pyramid was being built.

Why the Pyramid Stopped Functioning

What happened to the Giza Power Plant?

As noted by Sir Flinders Petrie in Pyramids and Temples of Gizeh at some time in the past, the upper chamber was subject to a force powerful enough to force its walls outward over an inch. Since its discovery, the displacing of the upper chamber has been believed to be the result of an earthquake. However, the difficulty with this explanation is that the middle chamber and other, lower passageways of the pyramid show no signs of earthquake damage. Petrie surveyed the descending passage and found incredible accuracy in its construction, .020 inch over 150 feet and .250 inches over 350 feet. So there is no indication that the structure shook to the extent it would have to in order to move a chamber located 175 feet above the bedrock. Furthermore, the effect of an earthquake would have been a collapse of the chamber, rather than its expansion. There are also cracks in the chamber’s ceiling that cannot be explained by settling.

Dunn theorized that the only other reasonable explanation was that an intense explosion, triggered by a power surge from an earthquake, occurred within the resonance chamber and resonator hall. A reasonable hypothesis if hydrogen gas was being produced in the pyramid. Hydrogen gas is highly combustible.

In 1999, Dunn had the opportunity to validate his theory while filming a documentary. The Great Pyramid had been closed for a time and scrubbed clean, and with the bright lights of the camera, what he found was remarkable. It has always been believed that the walls and the ceiling of the Grand Gallery were made of limestone. However, after the thorough cleaning it was obvious that the ceiling was made of highly polished granite. The transition to limestone in the Grand Gallery’s construction occurred farther away from the resonance chamber.
Figure 10.3 Resonators and frame assembly in the Grand Gallery
(Courtesy of Christopher Dunn)
The Grand Gallery, equipped with 27 banks of Helmholtz resonators.

Figure 10.4 Side view of resonators and assembly in the Grand Gallery
(Courtesy of Christopher Dunn)

Figure 10.5 Scorch marks in the ceiling of the Grand Gallery
(Courtesy of Christopher Dunn)
Figure 10.6 Scorch marks in the ceiling of the Grand Gallery
(Courtesy of Christopher Dunn)
More importantly, scorch marks were evident on the ceiling and walls, and since a thorough cleaning had just been completed the marks could not be explained by soot from torches. More importantly, since those marks were actually a discoloration of the granite the best explanation is that the gallery was exposed to intense heat. Furthermore, the pattern left by the heat is pronounced and unmistakable, as if the explosion blew through the slots in the floor of the Grand Gallery.

For a distance of about twelve inches, underneath each of the Grand Gallery’s corbelled layers the heat damage is concentrated in the center of each scorch mark. If a straight line was measured from the center of each scorch mark and projected downward towards the gallery ramp, a line is formed directly to the slot in the ramp. This means that the scorch marks on the ceiling approximates the design and location where the resonators were mounted. Pairs of scorch marks appear where the resonator support structure would have been placed.

The granite box inside the resonance chamber provides a further clue of intense heat. Granite that litters the Giza Plateau and the granite casing stones still in place on the third pyramid are from Aswan. All the granite is red granite. So, it’s a very safe assumption to make that the builders used the same granite to carve this box. Whatever happened in the resonance chamber was hot enough to turn red granite into black granite.

Depending on other elements present at the time of the power plant's malfunction, it is conceivable that certain changes would be recorded in any object fortunate enough to survive. The comparatively thin sides and base of the coffe r would naturally be more susceptible to excessive energy levels than would the large granite blocks of the walls and ceiling. Most likely, the granite box was cooked under intense heat.

There is yet another telling clue indicating that an explosion occurred inside the great Pyramid. When the area above the resonance chamber was discovered by Nathaniel Davidson it contained a black powdery substance. No one knows why this black powder was there or what it was. Speculatively, it was believed to be exuviae, the cast-off shells of insects. However, what makes more sense is that it is soot from burnt limestone dust.

The operators of the pyramid must have been alarmed at its sudden malfunction. What might have happened is that they entered the pyramid to inspect it for damage by climbing down the Descending Passage and then up the Well Shaft to the level of the Grand Gallery. They probably cut through the area just above the resonance chamber where they inspected the next layer of granite. While in this chamber they could have cleaned away the limestone dust (exuviae) from the top of the beams. As a result, the exuviae wasn’t discovered until an opening was made by Howard Vyse into the chamber above.

Pyramid Building with Reason

Despite Dunn’s profession and brilliant reserve engineering of the Great Pyramid, there has always been the problem of what the energy generated was used for. When we think of a power plant the smokes stacks of a coal fueled plant or cooling towers of nuclear plant and a thousand-mile grid system for distribution comes to mind. But this most certainly was not the case thousands of years ago. There is no evidence to support the notion that the builders of the pyramid developed a grid system or used electrical appliances like we do today. So, what was the energy used for?

For the past fourteen years, inventor and physicist John Burke has been studying the use of electron bombardment to enhance seeds, and has been extraordinarily successful in improving seed germination and stress tolerance. After eight years of laboratory testing and six years of field testing, his results have been very promising for the agriculture industry; quicker plant maturity and higher plant yields without the use of chemicals or moisture.

A number of universities and seed companies have collaborated with his company, Pro Seed Technologies, to test his process called MIR/Stress Guard™ such as Florida University, Iowa State University, Mississippi State University, Mississippi State Seed Company, North Dakota State University,
How does electron bombardment enhance crop yields?

Seeds are showered with extremely low energy (i.e. slow-moving) electrons which are absorbed by the seed. As a result, the seed’s cell mitochondria produce more free radicals, which in turn trigger the cell’s natural defenses to produce more antioxidants. Once these antioxidants are produced they destroy the free radicals and leave the seed with fewer free radicals to battle. Thus, the seed is stronger and better prepared to handle stress such as flooding, drought, and temperature extremes during its planting season.

Environmental stress damages the plant cell structure by increasing free radical production. So, the low energy electron bombardment acts as an inoculation thereby making the seed’s immune system stronger.

Burke’s patented MIR/Stress Guard™ System (Molecular Impulse Response) technology “improves the seed’s antioxidant capacity (Source: Purdue U.), and therefore its shelf-life (Iowa State U.) and its ability to withstand a wide variety of environmental stresses. It also enhances growth in numerous ways and can be used in conjunction with traditional chemical seed coatings and on genetically-modified seed.”

In this process, seeds are passed in quantity between two electrodes which are calibrated to produce an electrical impulse specifically targeted for that type of seed, such as corn, wheat, soybean, etc. The seeds respond by releasing free radicals and then increase its production of antioxidants to compensate and restore cell balance. In the end, the free radical level is lower than prior to the MIR process.

What does the bombardment of seed with low energy electrons have to do with ancient Egypt’s pyramids? Burke, who is also interested in ancient agriculture, has a possible answer.

Solving the Megalith Mystery

Ancient stone monuments, such as Britain’s Stonehenge, have remained a mystery for thousands of years. Some megalithic sites are believed to have been calendars to mark the seasons. Other sites, such as Asbury in Southern England whose stones are arranged in a grid, seem to defy explanation. Burke suspected that there might be something to these stones much more significant than a calendar.

In researching his theory Burke and his colleague, photographer Kaj Halberg, visited more than 80 different sites, from North America to Europe and Egypt. Armed with a fluxgate magnetometer (to measure the Earth’s geomagnetic field), an electrostatic voltmeter (to measure electric charge in the air or on objects), and ground electrodes (to measure naturally occurring current in the ground) they tested each site to see if a naturally occurring excess of electrons was present, as opposed to a normal amount in the atmosphere. They were. Furthermore, Burke and Halberg discovered that the source of this electromagnetic anomaly was a result of local land formations called conductivity discontinuities, and how these land formations affect Earth’s geomagnetic field.

One common geomagnetic anomaly you are likely familiar with is the aura borealis, the ‘northern lights.’ Earth generates a magnetic field that exists all around us which protects us from harmful solar radiation (high energy particles). When the Earth is struck by powerful solar winds, its geomagnetic field is pushed inward or depressed as it deflects these high energy particles. As a result, air at the outer edge of the atmosphere becomes so excited in reaction to the solar radiation that it glows.

Another effect of the Earth’s geomagnetic field is its reaction to Earth’s rotation. During the night, when solar radiation is at a minimum, the lines of the geomagnetic field lengthen. At dawn, the solar radiation returns and as a result the geomagnetic field shrinks making it stronger. At certain places on
the Earth’s surface, where unique land features exist, this surge of energy when the geomagnetic field returns to its daytime configuration is amplified.\(^9\)

The underlying physical law behind this natural event is an electromagnetic principle called *induction*, which means wherever there is a moving electric current a magnetic field is generated, and that a changing magnetic field generates an electric current in anything that conducts it. It is the same principle as a power station. The energy generated from burning coal turns a copper wire around a magnet generating an electric current, which is then sent out on lines to be consumed by the machines of our electric powered lives.

At dawn, what happens on the Earth’s surface is that the change in the magnetic field’s strength generates weak direct electrical currents (DC) in the ground. Different types of materials have different levels of conductivity. As such, there are certain geographical places that conduct electricity more than others; ground that holds lots of water or ground that contains a high content of metal conducts better than drier and less metallic ground.\(^10\)

Where highly conductive land intersects with land that is relatively non-conductive (referred to as a *conductivity discontinuity*) Earth’s magnetic field behaves differently. When the electrical current traveling though the ground runs into these conductivity discontinuity features Earth’s magnetic field lines can be significantly strengthened or weakened. If the ground current’s reaction to the geologic discontinuity is to strengthened Earth’s magnetic field, then in turn, more electric current is generated. What’s so special about this is that the ground current will attract electrified air molecules of the opposite charge, i.e. a positive ground current will attract negatively charged air molecules, and vice versa.\(^11\)

According to Burke and Halberg, ancient cultures understood this principle and selected conductivity discontinuities as a place to build in order to take advantage of the electrical currents running through the ground. Stonehenge, for example, was built in the shape of a ‘C’ and with a three-foot ditch at the perimeter of the ‘C’ to trap and concentrate the current in the middle of the henge. In the America’s, native cultures built earthen mounds with flat tops on conductivity discontinuities in order to attract atmospheric field lines without attracting a lightning bolt.

While a thunderstorm is occurring ground currents are typically positive, and any concentration of negatively charged air will always seek a connection to the ground. This is why lightening strikes. The atmosphere builds up with negatively charged air molecules (a process called ionization) until a threshold is met where it seeks the nearest positively charged object. And, when the negatively charged air connects with that positively charged object, a lightning bolt occurs.

However, aside from a thunderstorm, the Earth’s surface typically has a negative charge and the atmosphere, a positive charge. Where the Earth’s surface protrudes into the air, the positively charged field lines will concentrate. Likewise, the negatively charged field lines in the ground protrusion will concentrate in the smaller area of the mound’s top. As a result, the area at the top of the mound becomes ionized, but not to the point where it discharges a lightning bolt. So, seeds placed at the top of the mound would, at certain times, be exposed to slow moving electrons, which, according to Burke’s research, are then cajoled into creating anti-oxidants in order to soak up free radicals created by the ionized air. Thus, the naturally occurring energy serve a natural flu shot for the seeds, and when planted grew faster and larger.\(^12\)

So, here there is a possible reason why the pyramids were built. There could be no better motive for a civilization to expend so many resources in order to build pyramids in so many places in a line north and south next to the Nile River. According to Christopher Dunn, the Great Pyramid was designed as a power station to produce energy. Could this energy have been used for agriculture in a manner described by Burke and Halberg?
According to Burke’s theory, whoever built these pyramids might have been creating artificial conductivity discontinuities designed to ionize nitrogen in the atmosphere, possibly with the Great Pyramid as the engine. However, unlike the smaller stone structures of Europe created for seed bombardment, the pyramid builders had a slightly different reason intended for their structures. Instead, the pyramids were part of a nation-wide project to fertilize the farmer’s fields by turning nitrogen in the atmosphere into nitrate for crop fertilization. Brush discharge created by energy flowing from the peak of the pyramid ionized nitrogen molecules in the air turning them into nitrates that would eventually fall to earth to be digested by plants. Could it be the case that Dunn’s power plant performed the function of emitting negatively charged ions (free electrons) is quantities large enough to ionize significant amount of nitrogen?

According to Burke’s research, everything about the Giza Plateau and the other large pyramids suggest to me that this is the case. Giza’s three large pyramids, as well as the smaller satellite pyramids, were created from rock taken from west bank of the Nile, a limestone rich in manganese called dolomite. Because of the manganese the dolomite effectively conducts electricity. Over its dolomite core, the Great Pyramid was cased with limestone containing low levels of manganese called Tura limestone, and as such acts as an insulator of electricity. Although very little of Great Pyramid’s casing stones remain, what exists testifies that insulation was a building requirement.

The outer casing stones of the Great Pyramid were cut and polished with such precision (1/100th inch) that even today not even a razor will fit between two adjacent stones. Such a task takes time, so there must have been good reason to be so precise. Thus, using the Tura limestone to create a blanket of insulation would have been a very good reason to require precision. None of the charge created inside the pyramid would leak out into the atmosphere. With an insulator, the negative charge throughout the pyramid’s base would be focused to its peak, which, according to legend, was a gold capstone.

Not only is the Giza Plateau at the intersection of two major limestone layers (the Mokkatam and the Maadi) but, originally, the plateau was not a naturally flat surface and it had to be leveled in order to support the Great Pyramid and the other two pyramids. Within the bedrock of the plateau the limestone strata tilts down toward the river which forms the edge of the Nile Valley aquifer. More importantly, water moving through rock creates electrical current, and all three pyramids were built in a line where two aquifer layers rise to the surface maximizing the concentration of current from the ground going into the pyramid. Furthermore, since the Giza Pyramids were aligned along a tongue-like formation (peninsula) of the Mokkatam limestone, and the formation itself was narrowed by the quarrying of stone for the pyramid, the base of the Great Pyramid covered most of this tongue-like formation. The result was that the placement of the pyramids on the plateau created an undisturbed causeway enclosed by a henge. For Burke, the placement of the pyramids is significance since the existing ground current in the entire peninsula was concentrated in a small piece of ground right below the pyramids.

In North Africa, with spring come sand storms brought by strong desert winds. Known as khamsin, these easterly gales out of the Sahara bring with it an excess of positively charged ions. (Friction between sand particles adds to the electrostatic charge of the wind.) These conditions set up an ideal situation for the Giza Ion Generator, a situation ideal for electric brush discharge at the pyramid’s peak. This is the same type of situation that exists in a thunderstorm, except that the threshold is not crossed for the creation of lightning bolt. And, like a thunderstorm, brush discharge ionizes the atmosphere turning nitrogen into nitrates. In Egypt, during the Khamsin, ionized nitrogen would be generated from the reaction between the negatively charged ions from the Great Pyramid and the excess positive ions in the atmosphere.

Unfortunately, ions emitted from a single peak would flow in all directions. Since Giza is situated to the west of the Nile Valley only a small section of farm land would be affected. However, by placing
smaller pyramids, which also have a negative charge, next to the large pyramids the ionizing nitrogen flow could be directed to the desired area. By placing smaller pyramids to the south and southeast of the larger pyramids the flow of ions would be directed to the north and east. This is precisely how the pyramids and their satellite pyramids were situated. From Meidum in the south to Giza in the north during the spring the ionized nitrogen in the atmosphere rained a blanket of nitrates over the Nile Valley, perhaps twenty miles wide and forty miles long.

For Burke and Halberg, the names given to the pyramids by ancient peoples seem to confirm their theory. For the Romans, *pyramis* and *mid* (fire and middle meaning fire in the middle) created the word we use today to describe these structures, pyramid. The ancient Egyptians simply referred to the pyramids as light, *takhat*.\(^{16}\)

**A Network of Pyramids**

If the Giza pyramids were designed to release free electrons in order to ionize nitrogen and create nitrates that would move east and south in order to fertilize the fields, then why weren’t all other pyramids internally designed in the same fashion as the Great Pyramid? The logical answer is that there only needed to be one ion pulse generator. If so, then what function did all the other pyramids perform?

According to Burke and Halberg’s theory, the pyramids were constructed in order to create and enhance subtle electrical fields called conductivity discontinuities. It might be the case that the pyramids down range of the Great Pyramid also created negatively charged ions that would assist the flow further south.

If this were the case then each successive pyramid farther south would need to have an electric potential more positive than its neighbor to the north. To accomplish this each successive pyramid to the south would need to be slightly shorter and smaller than its northern neighbor. Although not all pyramids have retained their original height, the general tendency is that each pyramid is shorter. The Great Pyramid at Giza is 481 feet tall. At Dahshur, to the south, the Red Pyramid and the Bent Pyramid are 341 and 344 feet tall, respectively. Even further south, the final pyramid in the network, at Meidum, has been calculated to have been 306 feet after its completion.

Like-kind charges, such as negative and negative, repel each other, and opposite charges attract. In the case of negatively charged ions flowing to the south as they approached each secondary pyramid, that pyramid’s negative charge would repel the ions around the pyramid and down, again to the south and east; while at the same time assisting in attracting the flow of ions because of their less negative charge.

This might provide a clue to why the pyramid at Abu

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16. For further reading on the names of the pyramids, see Burke and Halberg’s *The Age of Pyramids*.
Rawash was abandoned early in its construction. A more suitable site was identified at Giza where the natural land formations maximized the potential for electrical charge.

**Resolving the Mental Paradox**

I find it absolutely mystifying to read books on how the Great Pyramid was built because a mental paradox is almost always created. Why I muse is that within the human experience there is a practice called belief. Everyone has beliefs and belief is such a force that at times reality can be suspended for the simple gesture of accepting a paradigm even though it belongs to a time long since passed, or for the simple fact that rejection of that paradigm means certain death of one’s career.

Whatever the case may be, it is gratifying to discover that my friend, and colleague, Christopher Dunn is correct in his analysis of the precision quality in which the Great Pyramid was built. Even some Egyptologists now recognize this fact. In his new book *The Great Pyramid* Veteran Egyptologist John Romer states as much:

> The first thing I had discovered was that, unlike the royal tombs of Thebes, the combination of the Great Pyramid’s colossal size and extraordinary precision – for the accuracy of its architecture can be measured on occasion within fractions of an inch – easily defeats the efforts of a modern draftsman.\(^{17}\)

And:

> As well as being the most accurately surveyed building in the modern world, the Great Pyramid is also one of the most accurate the human race has ever made; some of the elements of its architecture are yet precise to within a fraction of an inch.\(^{18}\)

Yet, in the same breath Romer attributes a “single construction plan” that was used in the construction process to a “pre-literary age” where “the Great Pyramid’s construction were integral to its design... and that subtle harmonies held within its architecture are the product of the methods of its manufacture; of its craftsmen and their specific use of their materials.”\(^{19}\)

It’s the same old story: in their brilliance and genius the pyramid builders designed and constructed with precision the most monumental and majestic structure known to man, but used only the simplest of handheld tools - copper chisels and wooden mallets. The chisel marks on the Great Pyramid’s limestone course blocks and in the southern quarry are proof enough it is thought. Yet, a man carved out the descending passageway 350 feet laying upside down banging away at the stone and bedrock with a copper chisel, and was precise to within a quarter of an inch from being perfectly straight? It would have taken a super race of men to accomplish such a feat.

At one time automobiles were built with hand tools, and to some extent today they still are, although computer-driven robots have come of age in the manufacturing process. What is missing in this explanation of automobile manufacturing is that other industries exist including steel and rubber production, metal fabrication, machining, and tool making. All of which worked together in the process of manufacturing a single car.

If a model T Ford was somehow preserved in the ground and then excavated 10,000 years in the future along with a crescent wrench, a screw driver, and a ball-peen hammer would a logical conclusion be that the model T was built with only those tools found? Because we know that manufacturing an automobile requires more than a few hand tools we would say, of course, ‘no.’

So, shouldn’t we apply the same treatment of logic to the Great pyramids and all the other wonderful artifacts of this granite civilization? We should, and the stone at Abu Rawash with its clearly defined feed lines cries out to every machinist, every carpenter, and every person who has used power
tools that simple hand tools were not the only tools used in the process of pyramid building. It is the only way to resolve the mental paradox created by the gatekeepers and denizens of public thought.

What theory best fits the evidence is that settlers and migrating cattlemen found the infrastructure of a derelict civilization in the Nile Valley. The granite temples and pyramids of Abu Rawash, Giza, Sakkara, Abu Sir, Abu Gorab, Dahshur, and Meidum already existed. Self contained and with no obvious entrance the new caretakers of the pyramids assumed they were tombs. What else could they be? Naturally, the people migrating to the Nile Valley re-occupied these ancient sites and added new structures to the old. Out of mud brick and small stones villages were built such as the houses erected along the causeway that links the middle pyramid to the Sphinx or the small irregular houses built near the Giza’s third pyramid.

These feebly built structures were reduced to rubble and covered with sand long ago. When discovered in 1932 by Selim Hassan their walls were chest high and still displayed some red, white, and black paint. Today there is little remaining of them except a dark spot on the ground.

According to Egyptologists, an eastern town at Giza was crowded. Domestic granaries, storage bins, and grinding stones have been found as well as traces of alleyways between houses. More than 5,000 mud ‘sealing’ were also found some of which bearing the names of Khafre and Menkaure, two rulers of the fourth dynasty.

Where there is a village there will also be a cemetery, which is what Egyptologists have always claimed Giza was designed for. Adjacent to the Great Pyramid are two masataba fields, typical burial mounds of early dynastic Egyptians. However, at Giza’s southern end is a cemetery where commoners were put to rest. Its lower portion contains six hundred simple graves and thirty larger tombs. According to examinations half of those interred here were female with children accounting for twenty-three percent of the total. One tomb was built with a square courtyard. Its walls made from broken limestone but it also contained pieces of granite, basalt, and diorite; the same types of stone that were used to build Giza’s pyramids and temples.

If these Old Kingdom villages belonged to the pyramid builders, assuming that Giza was intended to be a necropolis, surely these families would have moved elsewhere after the pyramid projects were finished. Why would the rulers of the Old Kingdom allow families to stay on sacred ground unless they too lived among them? Yet, no royal mansions attributable to the Old Kingdom have been found.

In no way can these Giza villages be considered as evidence of those who built the pyramids. Nor can the existence of a cemetery be proof that it contains the remnants of those who built the pyramids. Such thinking escapes the objectivity of science and the sincere investigation of scholarship. The only proof that this evidence yields is that people lived on the Giza Plateau during the early part of the second millennium BCE.

A much better explanation of the evidence is that at some time in the remote past a technically advanced civilization existed with the skills and power to quarry, move, and dress multi-ton blocks of stone, and with the technology to cut and shape granite into beautiful temples. And if a technically advanced civilization did exist in prehistory it should also be the case that its existence, its legacy, should have been remembered and carried forward in legend, myth, and story.

Although ancient legends and myths are highly suspect today, they were an important part of ancient cultures. With a very small percentage of the population being literate and the cost of creating documents tedious and expensive the most effective way of disseminating knowledge and history was through the art of storytelling. Stories are much easier to remember than a list of facts.

Fortunately for us, as civilization progressed so did the need for documentation, for business reasons as well as the humanities. A class of scribes developed and grew as did institutions for learning. As such, our ancient ancestors wrote down these stories and legends that were so popular in ancient times. For the Hebrew people what history exists can be found in the early chapters of Genesis, Noah’s Flood, the Tower of Babel, and the story of Abraham. For the Egyptians it is the king’s list of the Turin Papyrus and the Palermo Stone and a web of various myths and legends.
A Network of Pyramids

In our narrow minded approach to the past we have consistently attributed these myths and legends to religious fascination of primitive thinking people and discarded any other means of interpretation, mostly as a result of improperly translating the Egyptian word for ‘god.’ Neter (NTR) is the Egyptian word that eventually came to be god for the Greeks, and God for the Hebrews, although this is not actually the case since English is a relatively recent language. Nonetheless, Neter referred to principles of nature and there are many principles to describe, such as digestion, respiration, and procreation to name a few. And in Egyptian thought animals were chosen as a way of expressing a natural principle according to that animal’s natural qualities.

For example, the jackal, which scavenges food, can eat almost anything, even rotten meat. As such, the jackal is an apt symbol for the principle of digestion and when the head of a jackal is depicted on a human body in art the artist is referring to the principle of digestion as it relates to humans. Thus, there is an explanation for placing the deceased’s stomach in a jar whose lid is carved in the shape of a jackal’s head. Likewise, the lid of the jar that holds the deceased’s liver is in the shape of a man’s head since the liver appears to be a critical organ for the human personality. Liver ailments can significantly alter one’s personality.

With this symbolic approach to understanding the legends and myths of ancient Egypt a better understanding of their knowledge can be achieved, as well as a better understanding of what they might have viewed as their history and legacy. Like the Hebrews, the Egyptians had their own tradition of catastrophe. And like Noah’s Flood and the Tower of Babel mankind suffered decimation at the hands of ‘God’ but for the Egyptians the culprit was known as Hathor, a cosmic principle that gave life to all. A temple to her was erected at Denderah and carved into that temple was a message.
History is more than a written record of past events. It is also our cumulative memory as a civilization. Regardless if this cumulative memory is disseminated orally or through the documents, how we know what occurred in previous years, centuries, or millennia, relies on civilization being a continuous human endeavor. Yet, there are always gaps in history where information is minimal or non-existent. To fill in these gaps those involved in the study of history create models based upon the best available evidence from such disciplines as archeology and anthropology.

In constructing a model for our civilization’s history, a beginning is determined and marked by the oldest written record or the oldest known public structure. Such a mark signifies civilization’s origin. Today, based on the best available evidence history marks the beginning of civilization around 3000 BCE with the rise of hierarchical societies and the construction of public structures in the Indus, Mesopotamian, and Nile Valleys as well as the Coral of Peru.

Before the nineteenth century history’s model was based on the Bible. The age of the Earth was calculated to be 4000 years old, according to the lineages of the Genesis patriarchs. Shortly thereafter Civilization began. In effect, the universe, Earth, mankind, and civilization were an act of divine creation.

During the nineteenth century the discovery of bones from extinct species of animals changed everything. Not only was the Earth believed to be much older, but mankind was no longer a divine creation. Instead, Man was the end product of a chance occurrence given the correct mix of chemicals and the random mutation of form. Fueled by the burgeoning fields of geology and archeology, historians now had a new model in which to interpret past events. Evolution became the darling of the scientific world; everything was considered in terms of evolution: the evolution of animals, the evolution of man, the evolution of the cosmos, the evolution of cultures, even the evolution of religion. Such thinking spilled over into other aspects of society. There is the evolution of automobiles, weapons, computers, and so on. Almost every aspect of society is viewed in terms of evolution. And just like everything else, civilization is also believed to have evolved in linear fashion.

A History of Catastrophe

Catastrophism, once the foundation of geology, was replaced in the middle of the nineteenth century by uniformitarianism, the assumption that environmental conditions of the past are the same as the present. Any changes that occurred did so over a long period of time. However, during the past twenty years geologists have fully embraced the concept of catastrophism as a major role player in Earth history. Catastrophism is now viewed as an important evolutionary ingredient responsible for five mass extinctions during the last five hundred million years - the Ordovician, Devonian, Permian, Triassic, and Cretaceous extinctions.

Why past catastrophic events are not evident is because our environment is self-maintaining. The atmosphere we live in and breathe is caustic. Over time everything decays and returns to the raw materials it was forged from. Meteor craters from celestial impacts are smoothed out by rain and flowing water, then filled in with soil from seasonal winds. Very large craters disappear into a fertile valley of grasses and trees. However, the evidence for Earth’s violent past is obvious according to our closest celestial neighbor. The moon displays numerous impacts, some extremely large others quite small. Being much larger than the moon, the Earth would have attracted many more stellar objects because of its size.

The most recent mass extinction occurred between 15,000 and 11,000 years ago but there is no evidence of a devastating celestial impact. Despite the fact that wooly mammoths, mastodons, saber
tooth tigers, and other mega fauna ceased to exist whatever happened to cause their extinction has
geologists baffled. A few geologists believe there was no catastrophe and that Man himself was
responsible because of over hunting practices.

Whatever the case, the extinction that ended the Ice Age decimated the animal species that
inhabited the Earth at that time, particularly mammals. Human cultures existed at that time so they
too lived through whatever circumstances brought an end the age of the mega fauna. Yet, according to
the official historical record humanity has no record or memory of this catastrophe. However, if a global
catastrophe reduced the human population to a few million, or less, and if any civilization that existed
was sophisticated after a few thousand years how would we know they ever existed?

With a small number of survivors they would not have been able to maintain any civil infrastructure
and would be forced to abandon their life-style in favor of survival, which means hunting and fishing and
a rudimentary style of agriculture. Everything that had ever existed unless it was built out of stone
would have disappeared.

Catastrophes do occur as we have been reminded. The December 2004 tsunami that spread
destruction on the shores of the Indian Ocean was a brutal reminder of nature’s awesome power.
Countries from Asia to Africa were pounded by its devastating power. With more than a quarter of a
million people dead, it punctuated our current fascination and fear of cataclysms with a clear
understanding of our own frailty and mortality.

Unfortunately, there are many interpretations of an event like the 2004 tsunami. Some of which
accompany self assessment and a natural guilt of why such a terrible disaster would occur, particularly if
a loved-one suffered as a result. Blame for the catastrophe would be internalized, and those who do so
would wonder what they did to invite the wrath of God Almighty. Even lesser tragedies invite a feeling
of separation from nature (or God) and are accompanied by self loathing. Consuming grief sponsors a
need to direct blame elsewhere, and to externalize it. Anger and pain will dole out blame in many
directions, but when anger turns into exhaustion the pointing finger turns inward and the mind rises
above the pain looking for an answer that will provide a feeling of control over the uncontrollable.
Ultimately, that control is nothing more than an illusion and there is no control except over one’s self.
Eventually, inner peace is achieved through reflection and then comes the realization that if pain is
God’s punishment then selfish pleasure must be its cause.

We accept pain, and in a sense it makes us feel alive, even while we search for someone or
something to pin it on. Such is the human experience, but the same principle works on civilization, at
times, and does so in a massive way.

In December of 2004 the survivors of the Sumatra tsunami learned what the ancient Egyptians
experienced many thousands of years ago.

The Face of Hathor

Hathor is very ancient, one of the oldest gods in the Egyptian religious tradition, and nearly identical in
principle to the Great Mother Goddess of prehistoric Europe. She represents the creatrix of life. Not only
did she bring forth and maintained all biological life, but she also nurtured the souls of the deceased in
the duat. According to tradition, she came into being as the ‘Eye of Ra,’ and functioned as the mother,
consort, and daughter of the creator sun god. She is the mother of the celestial falcon, the Lady of the
Stars, and the mother of all gods. She was the goddess of the sky.

In the beginning, Hathor united with the Creator to create all that exists. She was the hand of Atum
as he created as well as the divine ‘seed’ from which the universe came forth. In Egyptian myth, Atum,
the absolute and omnipotent God, gave birth to himself and created all that exists (the universe) by
masturbating. In a less symbolic version, Atum created by projecting from his heart and brought forth
the eight primary principles known as the Great Ennead of Heliopolis. These were the nine great Osirian
A Message at Denderah

gods: Atum, Shu, Tefnut, Geb, Nut, Osiris, Isis, Seth, and Nephthys. In the Pyramid Texts, Osiris, Isis, Seth, and Nephthys represent the cyclical nature of life and are in essence a part of Atum.

In principle, the ancient Egyptians expressed a reasoned theory of the universe’s existence. They taught that before there was life the universe existed in a state of chaos, which was described as a “dark watery domain of unlimited depth and extent.” They referred to this as ‘Nun.’ From Nun came the eight known as the Ogdoad of Hermopolis, which consisted of four pairs of two, each pair being a male and a female. The Nu/Naunet pair represented the primordial or ‘initial’ waters, Amun/Amunet the air (invisibility) or the ‘void,’ Kuk/Kauket as darkness, and Huh/Hauhet were infinite space (eternity). The male ‘gods’ were depicted with the head of a frog, and the goddesses with that of a serpent.

In the original version of the myth, the Ogdoad arises out of the waters thrusting up the primeval ‘mound,’ also known as the Benben stone which was honored at Heliopolis where it was said the sun was born. The power of the sun was the first light and came with the first appearance of the creator. It puts an end to the watery silent darkness that the ancient Egyptians represented in various ways. Amun-Ra and the goddesses Neith and Hathor then establish ‘maat,’ meaning ‘the divine order’ – the Cosmos. In the end, the Egyptians refer to the creator as the “One Who Made Himself into Millions” and view life and the cosmos emanating from a single original force just as the cosmologist today theorize in the Big Bang all that exists was at one time a single indescribable point.

The Ancient Egyptian Goddess Hathor symbolized the duality of life. As in all religions and philosophies, the concept of a God or Goddess is not referring to one particular entity, but a condition or aspect in nature that teaches us to understand the natural order of events. That there is action and consequence, cause and effect, and no matter how hard you try to avoid it what comes around goes around.

Figure 11.1 The face of Hathor, from the Temple of Denderah
The Stone at Abu Rawash

Hathor literally means ‘House of Horus’ and as such she was the mother of Horus, symbolically the mother of ‘Man.’ During the earliest dynasties Hathor represented the mother principle (a goddess) in a cosmic sense as well as the physical. In ancient Egyptian philosophy, Man is a representation of the Cosmos so the principle of the mother is creative in a cosmic sense as well as procreative in an earthly sense. Man, as an archetype, is a created being and man, as a unique individual, is a procreated being. In a cosmic sense Hathor was responsible for the state of the world and the universe, and in an earthly sense she was responsible for all the principles that makeup mankind such as music, dance, love, sex, as well as childbirth. Although Hathor gave life she could also take it away. As such, she also was the goddess of destruction. It is difficult to know if Hathor’s destructive side was always limited to the consequences of indulging in her pleasures, or if it extended to some destructive natural event and a more dramatic expression of her powers.

An elegant temple was built in Hathor’s honor at Denderah, north of Luxor. Today it is one of the most enigmatic sites in all of Egypt. In ancient times the Hathor’s Temple was known as the Castle of the Sistrum and Per Hathor, the House of Hathor, or the Domain of Hathor. Throughout Egypt’s dynasties it is said to have been a place of pilgrimage and worship, but after the ruin of the pharaonic way Denderah was abandoned, and then the wind and sand became its sole occupant. For nearly two thousand years Hathor’s temple remained half buried in sand.

Figure 11.2 Sketch of the Temple of Denderah at the time of discovery, c. 1870

Like other temples of the Nile, the Hathor’s Temple has a long history and has been modified a number of times. Its present form dates to the Ptolemaic and Roman eras during the first century BCE. The Romans constructed a birth house next to the temple entrance. Later, Coptic Christians erected a church. During the New Kingdom (1550-1070 BCE) Thutmose III, Amenhotep III as well as Ramses II and III are believed to have added to the temple complex. There is also an older birth house and an eleventh dynasty chapel dedicated to of King Nebhepetre Mentuhotep II. But there is also reason to suspect its original foundation dates back to a remote period of time. Inscriptions, still visible, refer to the work of earlier builders that date to the Old Kingdom (2650-2134 BCE) in the reign of Pepi I (2321-2287 BCE) and before him, Khufu’s reign (2589-2566 BCE).
However, all these additions pale in comparison to the breathtaking magnificence of the temple itself. It is difficult to describe with words because the temple was specifically designed to be more of an experience than a structure. The 18th century writer Amelia Edwards accurately captures its splendor:

The immense girth of the columns, the huge screens which connect them, the ponderous cornice jutting overhead, confuse the imagination, and in the absence of given measurements appear, perhaps, even more enormous than they are. Looking up to the architrave, we see a kind of Egyptian Panathenaic procession of carven priests and warriors, some with standards and some with musical instruments. The winged globe, depicted upon a gigantic scale in the curve of the cornice, seems to hover above the central doorway. Hieroglyphs, emblems, strange forms of Kings and Gods, cover every foot of wall space, frieze and pillar. Nor does this wealth of surface-sculpture tend in any way to diminish the general effect of size. It would seem, on the contrary, as if complex decoration were in this instance the natural complement to simplicity of form. Every group, every inscription, appears to be necessary and in its place; an essential part of the building it helps to adorn.
When gazing upon the magnificent columns of Hathor’s Hypostyle Hall it seems that a regret of cosmic proportion occurred. Fortunately, this magnificent hall is one of the most well preserved and impressive architectural masterpieces from all of ancient Egypt’s magnificence and splendor. Each column (there are twenty one in all) has a capital with the remains of Hathor’s face carved on four perfectly orthogonal sides. The capitals are ‘remains’ because each precision carved, geometrically perfect face been carefully and systematically chiseled away. With no nose and no mouth Hathor is now faceless.

Early Christians are said to have been the vandals. However, in ancient Egypt when a ruler fell from favor the succeeding regime systematically defaced his graven images and removed his name from the records. For example, in 1353 BCE, when Amenhotep III died, masons methodically chiseled out away any mention of Amun, the god of the great pharaoh. Likewise, after Akhenaten’s death in 1334 BCE, masons again entered Amenhotep III’s mortuary temple and re-carved Amun’s name, and erased all mention of Akhenaten. It might the case that in the collective ancient Egyptian mind Hathor was decommissioned as a principle of Nature. Without the ability to see or breath Hathor’s spirit could not exist.

The destruction, or decommissioning, of Hathor was performed possibly as a reaction to a cosmic calamity that accosted civilization. Those who created the wonders of Egypt probably looked back into history and saw the evolution of their society as well as all the technologies they had developed. Would they have believed that civilizations evolve in a linear fashion? If so, the destruction of the fruits of their labors would surely give them pause to consider the past.

Hathor’s Wrath

The story of Hathor as the eye of Ra echoes the tragedy of catastrophe that, from time to time, befalls our planet. It is in this context of Nature and the Cosmos that the destruction of Hathor’s face can be understood.

According to myth, humanity plotted against Ra so he summoned the gods in the primeval waters for their advice. After council, Nun and the other gods recommended that he send his Eye – the Eye of Ra (UTCHAT) - against the rebels for no other was more able to smite them than Hathor. So, as the eye of Ra Hathor overpowered mankind; slaughtered them and waded in their blood. There were survivors so the next day she was going to finish the task. However, for whatever reason Ra changed his mind and ordered his high priest on Earth to make beer and mix it with red ochre, and then pour it into the fields to a depth of the palm. When Hathor arrived the next morning to resume the killing she saw her beautiful reflection in the flooded fields. Instead of continuing the slaughter she decided to drink the mix of beer and ochre. Now drunk, she returned to Ra and spared what was left of mankind.

According to the Book of the Heavenly Cow, the Earth would never again be the same. Ra, now sick and tired, rode away on the back of Nut who transformed into a cow during a time when the Earth was enveloped in darkness. The survivors asked Ra to stay and shoot at his enemies, but he refused and upon his departure put Osiris in charge of mankind. With this change, a new era began with the lesser gods ruling the world. According to tradition, death came into being, and from that point onward mankind had maintain the divine order of the cosmos.

In another, later myth, the Eye of Ra (as Tefnut) went to Nubia to live as a bloodthirsty lion after being separated from her father Ra. Thoth was sent in an attempt to persuade her to return, but to no avail. She died and became Hathor, the goddess of the sky.

In another version Tefnut was in the form of a cat, the goddess Bast, who turned into a lion when angry. A great disturbance occurred in the order of the universe when the Eye of Ra was removed from Ra. And only when the Eye of Ra was returned to Ra was cosmic order restored.
Figure 11.4 Ceiling mural in Denderah’s Temple of Hathor
Figure 11.5 Hathor emanating from the sun in cones of energy on an upside down world
In yet another version, according to the Jumilhac Papyrus, Isis transformed herself into Hathor and destroyed with fire all the followers of Seth. Mankind, at that time, was divided by the gods into the Followers of Horus and the Followers of Seth, where the latter represented evil doers.\textsuperscript{10}

Although there are several versions of this myth telling the destruction of mankind, what is clear is that a catastrophe occurred that decimated whatever civilization existed at that time, and it had something to do with events in the sky. Both the Eye of Ra and Hathor, who was Ra’s daughter, are associated with the celestial realm. In the ancient Egyptian language the word for ‘eye’ (\textit{IRT}) sounded similar to another word in their language that meant ‘doing’ or ‘acting.’ So it may be the case that the word ‘eye’ would be what we, today, refer to as an ‘act of God;’ in other words, a natural catastrophe.

It was Egyptian tradition to identify the eyes with different aspects of the creator, almost exclusively celestial bodies: the sun, moon, the morning star (Venus), and Sopdet (Sirius). But Hathor, the eye goddess, was not associated with any known celestial body so she appears to be special. Among her attributes were water and fire. “Her fiery glance destroyed the enemies of the divine order while her tears created life.”\textsuperscript{11}

Little credence has been given to these stories to help describe history because they occurred in so-called ‘mythical times.’ But is there really such a thing as mythical times? Perhaps a more pertinent question is why are these times considered mythical? The most probable answer is that they are considered mythical because the stories associated with these times occurred before the age of writing before our civilization existed and are difficult to interpret. With such metaphorical language it is difficult to determine exactly what happened and when it happened.

In 1969, history of science professors Giorgio De Santillana and Hertha von Dechend published a book entitled \textit{Hamlet’s Mill} in an attempt to break the metaphorical code of mythology. The findings of their research dictate that those who are serious about understanding the past should look at myth more as a scientific language than a religious language. Their argument that ancient mythology was effectively an understanding of natural principles (science) is justified by their exhaustive work into the meaning of mythology. Myth is a specific type of ancient language, they content, that we are only now beginning to understand.

In the case of the Temple at Denderah, it was dedicated to Hathor and her myths. On the temple’s ceiling is a grand mural, Nut, as the sky, is seen in typical form bending over the Earth. But what is so unusual about this engraving is that the world is upside down. And Hathor, with a contemptuous look on her face rains down from the sun through what appears to be cones of energy.

Nut, upside down, can be nothing other than the world being proverbially turned upside down. And Hathor, in the stream of rays coming from the sun must be the cause of those rays. In relating this temple scene to Hathor’s myth the pertinent is ‘what is the eye of Ra?’

Our first clue is that the principle characters in the stories, Hathor and the Eye of Ra, are really a single character. Hathor as the daughter of Ra is the Eye of Ra. We also know that Hathor, although associated with a number of human traits, was predominantly a celestial or sky goddess and responsible for giving life to mankind. Our second clue is that whatever event the myth is referring to it was cataclysmic and global, and decimated mankind.

So, in order for the myths of Hathor and the eye of Ra to symbolize an actual event there needs to be a celestial and cataclysmic event that decimated mankind. Although a meteor or comet impact is likely candidates for such a cataclysm there are two problems. First, there is no evidence of a meteor or comet impact large enough to have global consequences since the Chicxulub sixty-five million years ago. Second, a comet or meteor large enough to be witnessed as a celestial event while still in its approach to Earth would likely be sufficiently large to destroy all life on earth. (The meteor that led to the extinction of the dinosaurs was only six miles wide.)

Despite these two problems a global catastrophe did occur at the end of the Ice Age, about 14,000 years ago.\textsuperscript{12} Whatever happened lasted for several thousand years and resulted in the mass extinction of numerous species; particularly large animals such as the mammoth and mastodon. The majority of them
died out between 15,000 and 11,000 years ago. However, what this catastrophe was and what its impact was on human populations is a mystery.

**Genesis and Catastrophe**

When in prehistory did this unknown granite civilization exist? The only source we have to go on is the word of the ancient Egyptians themselves. According to their records from 38,000 BCE to 14,800 BCE was a blurry period of their history when ‘the gods’ ruled. After 14,800 BCE the Shemsu-Hor (the Followers of Horus) ruled until Narmer establishment dynastic Egypt in 3100 BCE.

Exactly what, or who, ‘the gods’ were is unknown. At the time the Papyrus of Turin was written (c.1200 BCE) a period of 13,600 years had elapsed since the time when gods reigned. However, there are other ancient sources may shed light on these gods, particularly the Bible and other ancient texts.

The first five books of the Bible are attributed to Moses, who was born in Egypt and raised in the house of the Pharaoh. As Egyptian royalty, he grew up a prince and attended the finest schools where he learned math, philosophy, and history according to the Egyptian educational system of the time. Although the Bible has long been a source for theological exegesis, the Books of Moses was much more.

At a time of political turmoil in Egypt Moses led a movement of independence for a group of people known as the Hyksos, a group of people with Semitic origins from Asia. After centuries of living in the Nile Delta the Hyksos had become too powerful, politically, for the Egyptian government. The Hyksos lived in a strategically significant part of the eastern delta where any invasion force would likely march, if it came from the northeast.

As tensions mounted between the Hyksos and the native Egyptians, Moses (most likely along with other Hyksos leaders) decided it was best to leave and create a new independent state apart from Egyptian rule. But to do so would require much effort, an army, and the documents to create a government. Such was the purpose of the Books of Moses. They were theological and philosophical as well as a provider of laws. However, they were also historical and explained the course of mankind according to the history of the time, particularly the Book of Genesis where there is a possible historical reference to a remote time in history where, not gods, but sons of God existed as men of importance. In the introduction to the story of Noah’s flood:

> When men began to increase in number on the earth and daughters were born to them, the sons of God saw that the daughters of men were beautiful, and they married any of them they chose…

> The Nephilim were on the earth in those days—and also afterward—when the sons of God went to the daughters of men and had children by them. They were the heroes of old, men of renown.

*Genesis 6:1-4*

The Bible in Basic English translates that these heroes were “the great men of old days, the men of great name.”

Biblically, no more is written about these sons of God, but in the Book of Enoch (one of the apocryphal books) we discover that they were responsible for bringing civilization to mankind. Also referred to as ‘Watchers’ their teachings cover a long list of civil attributes: knowledge of the clouds, signs of the earth, sun and moon (calendar systems), observation of the stars, astrology, science of the constellations, the use of spices, sorcery, enchantments, the use of paint, as well as cosmetics and jewelry. They also instructed in the supernatural with the smiting of spirits and demons, and the medical with smiting of the embryo in the womb (abortion). But the most defining qualities of civilization the Watchers are credited with disseminating are that which we are now so famous for, the art of war and the methods of writing.
The essence of this ancient text has long been hidden behind a host of theories that explain the Watchers as demons, or evil spirits, that somehow mated with women to sire a breed of giants called the Nephilim. Unfortunately, over the past three thousand years the evolving meaning of demons and angels has clouded the significance of this passage. Demons and angels was originally the characterization of a person, such as ‘she is an angel’ because she is kind-hearted or ‘he is a demon’ because he is filled with anger and mean-spirited. We still use those words today in their original meaning.

The significance of these sons of God, these heroes of old and men of renown, is that they lived prior to a great catastrophe that the Bible refers to as Noah’s flood, and that they carried on the skills and teachings of civilization. A similar tale is told in the Tower of Babel:

Now the whole world had one language and a common speech. As men moved eastward, [a] they found a plain in Shinar [b] and settled there.

They said to each other, “Come, let's make bricks and bake them thoroughly.” They used brick instead of stone, and tar for mortar. Then they said, “Come, let us build ourselves a city, with a tower that reaches to the heavens, so that we may make a name for ourselves and not be scattered over the face of the whole earth.”

But the Lord came down to see the city and the tower that the men were building. The Lord said, “If as one people speaking the same language they have begun to do this, then nothing they plan to do will be impossible for them. Come, let us go down and confuse their language so they will not understand each other.”

So the Lord scattered them from there over all the earth, and they stopped building the city. That is why it was called Babel [c] —because there the Lord confused the language of the whole world. From there the Lord scattered them over the face of the whole earth.

a. Or from the east; or in the east  
b. Genesis 11:2 That is, Babylonia  
c. Genesis 11:9 That is, Babylon; Babel sounds like the Hebrew for confused.  

*Genesis 11:1-9*

At face value, the Tower of Babel is just another fable where God exercises his 'will' upon the world because mankind has been up to no-good. Now, mankind is building a tower to reach the heavens, presumed to be in defiance of God. Whether the tower existed or not is not the point of the story. What is the point is that a civilization was at one time unified by a single language, and could accomplish anything. But after God’s intervention mankind was scattered across the world and diverse became their languages.

In 3000 BCE, long before the Tower of Babel story was written into Genesis, no single language existed. Whether or not a single ‘Mother’ language actually existed is a highly debated topic in linguistics. Some linguists are certain that it didn’t but Joseph Greenberg (1915-2001), a prominent linguist and African anthropologist, believed that there was and placed his life’s efforts into understanding the historical relationships between the world’s languages.

According to Greenberg, there were twelve super families of language that may have been derived from a single ancestral human language. A concept supported by geneticists who have traced human DNA to a single, small human population in Africa 200,000 years ago.

If there was a single ancestral language at some remote time in the past we may never know. Nonetheless, geneticists think it is a real possibility and history as it was viewed by ancient cultures of the Middle East viewed it as fact. However, the real question is, was the Tower of Babel story the telling of an actual event or a morality tale on the evils of humankind. Since this story, and other stories in Genesis, was wide-spread during ancient times it is a fair assumption in the tradition of Santillana and...
von Dechend to conclude that it represents actual events. So what could the Tower of Babel story be referring to?

In the insurance business there is a clause that protects the insured from what is referred to as 'Acts of God.' These 'acts' are nothing more than natural disasters whether a thunder storm, hail storm, tornado, or flood. Five thousand years ago people surely blamed God for natural disasters just as much as they do today. Thus, what the Tower of Babel story is likely referring to is a natural disaster of immense proportions. The civilization that existed was decimated; leaving only isolated pockets of survivors. Over many generations those survivors struggled back onto the road of civilization, but because of their isolation unique languages developed in various regions.

Thus, in both the story of Noah’s Flood and the Tower of Babel there exists a civilization that is interrupted by a catastrophe. Although it does not state precisely what the catastrophe was in the Tower of Babel story, the story of Noah clearly describes a flood by torrential rains. However, a flood by water might be an allegory for a different type of flood.

The difficulty with a global flood is that five times the amount of water that currently exists on Earth today would be required to cover the surface of the planet past the highest mountain peaks. Furthermore, if such an event occurred it would likely change the composition of the atmosphere, permanently. Still, the story of Noah’s Flood has a predecessor in the Sumerian Epic of Gilgamesh, and in this epic the story seems to be more about the heavens than the life of a man surviving a great flood.

Although the Sumerians first recorded the story of Gilgamesh as early as the beginning of the second millennium BCE, its origin is much older. Its popularity in ancient times was unmatched by any other story. Hurrians, Hittites, Assyrians, and Babylonians rehearsed it in various ways throughout ancient times.

In the Epic story, when the heroes reached the cedar forest they decapitated Humbaba with the help of the powerful Shamash (the sun) who sent a great storm to blind the monster. Upon returning to Uruk, Gilgamesh washed his hair and dressed in festive attire. As he puts on his crown, Ishtar, the goddess of love, enthralled by his good looks asks him to marry her. Gilgamesh declines, and reminds her of the fate of her previous mates, particularly Tammuz (Adonis).

Humbaba was called a ‘god’ in the texts because ‘hum’ means ‘creator’ so Humbaba (Hum is the father) is the ‘guardian of the cedar of paradise.’ This corresponds to the Elamitic god Humba or Humban, who shares the title of ‘prevalent’ and ‘strong’ with the planets Mercury and Jupiter and with Procyon (alpha Canis Minoris). He also occurs in a star list, carrying the determinative mul announcing stars as mulHumba. More appropriately, Humbaba is actually a type of ‘god of the intestines.’ His head, except for the eyes, is depicted as being made from intestines in a single winding line.

Giorgio De Santillana and Hertha von Dechend, the authors of *Hamlet's Mill*, believe that apart from Procyon, Humbaba is referring to the planet Mercury or possibly Jupiter. But the latter would never make a convincing lord of entrails, or any other outer planet for that matter. Their orbits do not allow for such notions – and Venus is much too regular for this role. Mercury does since its orbit is the most erratic of the major planets.

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Only two celestial personalities are possible candidates for the role of Ishtar, the planet Venus, and Sirius. Both have the reputation of a harlot.

Scorned, Ishtar goes up to heaven in a rage and persuades Anu to send down the Bull of Heaven to avenge her. The Bull, awesome to behold, descends and kills a hundred warriors with his first snort. The two heroes tackle him. Enkidu grabs the bull by the tail and Gilgamesh, between the bull’s horns, makes the kill. Then Ishtar appears on the walls of Uruk and curses the two heroes who shamed her. In disgust,
Enkidu tears off the right thigh of Heaven’s Bull and flings it in her face amid brutal taunts. Celebration follows.

There is no need to continue the story for it is clear that its characters, much like Greek mythology, are symbolic of the movements of heavenly bodies. Later, Tablet IX tells the story of Enki’s (God) direct intervention in human affairs in order for Ziusudra to build an ark and survive the Great Flood. However, Ziusudra’s construction of an ark has nothing to do with a literal flood. The ark corresponds to the constellation of Argo. This, of course, has obvious and far-reaching implications.

According to Santillana and von Dechend, in ancient times “floods refer to an old astronomical image, based on an abstract geometry.”\textsuperscript{13} It is not an easy picture to see, considering the objective difficulty of the science of astronomy. However, simply put, the plane of the celestial equator divides the constellations into two halves. The northern half of the constellations, those between the spring and autumn equinox, represents dry land. The southern half, those between autumn and spring equinoxes including the winter solstice, represents the waters below. The four points on the zodiac (the two equinoxes and the two solstices) define the conceptual plane of the flat earth. Therefore, a constellation that ceases to mark the autumn equinox, thereby falling below the equator, sinks into the depths of the water. It is in this abstract way that a celestial flood occurs, which makes it easier to understand the Gilgamesh flood. It also makes it easier to grasp the ideas from similar myths, such as the Greek story of Deucalion, where devastating waves were ordered back by Triton’s blowing of the conch.

Like the story of the Eye of Ra, the Epic of Gilgamesh must have represented some grand celestial occurrence, and a dividing of history into ‘before’ and ‘after.’ It is a fair assumption to make that these ancient and famous stories – the Eye of Ra, the Epic of Gilgamesh, Noah’s Flood, and the Tower of Babel – all refer to the same event, and if the Papyrus of Turin is reasonably accurate, then a catastrophe brought on by some celestial event occurred sometime around 14,800 BCE when the Egyptian ‘gods’ ceased to reign and when the Shemsu-Hor began their reign. Ironically, this approximate date between the gods and the Shemsu-Hor corresponds with the end of the Ice Age and a catastrophe that resulted in mass extinction.
Built with limestone with its upper chamber formed from granite, and on a massive scale, with a level of precision matched only by modern technology, designed to produce energy, it is impossible to explain that simple people with simple tools were responsible for the Great Pyramid. Two and a half million blocks of limestone were used weighting somewhere neat six million tons costing an adjusted 18 million dollars. There is little choice than to accept the evidence. Only a sophisticated system of quarrying, transportation, logistics, designing, planning, and constructing could have accomplished such a project.

The Great Pyramid project was not an isolated event. It was common practice. Pyramids were built in a line up and down the west bank of the Nile River. Three were built at Giza. There is also Abu Rawash, Sakkara, Dahshur, Abu Sir, Abu Gorab, and Meidum. Huge temples adorned with colossal statues were built in the Delta, at Tanis, at Memphis and in an extraordinary way in the south, at Thebes. All were stamped with the name of Ramses with a geometrically idealized statue of Man, not that it deified an individual but that it expressed an understanding of Nature where mankind was the perfected expression of consciousness and self perception.

Such a civilization could never have been primitive or simple. The Industry required to create this granite civilization also had to have an academic system for the development of knowledge as well as the civil engineering skill to implement that knowledge. And any sophisticated industry requires large numbers of people who specialize in certain tasks to manufacture goods and provide services. By doing so, a scale of economy is achieved and that society can product increasingly more sophisticated products as well as products of a large scale. This is a principle of economics that was valid a thousand years ago or ten thousand years ago as much as it is today.

Simple tools limited to copper implements and stone pounding balls could have never erected the greatness of this civilization. The stone at Abu Rawash, the basalt patio at Giza, and the perfect pink granite boxes testify to that. Irrefutable evidence that whoever built these structures had achieved a degree of skill and knowledge on a level equivalent to our own.

Until now, resulting from a paradigm sponsored by arrogance and inflexibility this grand prehistoric civilization has been denied their legacy. With no other evidence except the structures themselves the paradox these structures create have been swept away by a willingness to confuse fact with theory, and evidence with the interpretation of the evidence. They say, since there is no trace of this civilization before 3000 BCE they must not exist! Of course, history is not science and there is increasingly less evidence the farther back in time the historian looks, a reality of our planet’s caustic nature.

There are plenty of traces left by this civilization. From thousands of magnificently carved stone vessels to machine feed lines to the ancient legends and stories of a civilization that once was. Still, what happened to this granite civilization is a puzzle with some of the pieces missing. Why did their civilization end?

Any advanced civilization of the past would have been at the mercy of Nature, be it cosmic or terrestrial. Today, with the highly sophisticated and integrated economy our civilization has built we are too. Fortunately, we have enjoyed peaceful skies for a very long time. What if that changed?

Apocalypse Now

Our civilization lives on a precarious equilibrium. Whether or know you believe that global warming is the result of civilization and the emissions of greenhouse gases or that it is a natural cycle, the evidence points to global warming as a real phenomena. But, the fact is global warming has been occurring for the last 13,000 years. Before that the northern climes that are so productive today were buried under
ice and snow. Our world could return to such a harsh climate in as little as ten years scientists claim if
the ocean conveyor that pumps warm water into the North Atlantic ceases to do so.

There is also the Armageddon asteroid, an asteroid sufficiently large to create a ‘total evaporation
impact’ that would scour the planet’s surface down to the bedrock. Before the 1960’s there was no
proof that rocks from space entered Earth’s atmosphere and impacted the ground. No one believed it.
Only through the determination of astronomer Gene Shoemaker and his work at Arizona’s Meteor
Crater did science take notice that space rocks did fall to earth. Now, we know that asteroids have been
impacting the Earth from the very beginning.

Today, near earth asteroids has become serious topic for some astronomers. There are more than a
few, astronomers have discovered. Alarmingely, it only takes a single rock greater than a few miles across
to pummel us into a dark age.

The most likely site of a meteor impact would be one of the oceans since two-thirds of the planet is
covered by water. Although this may seem like a relatively safe place for an impact, the energy created
by vaporizing rock would create a tsunami of unprecedented proportions. Billions of tons of water being
displaced would create a wave so large it is difficult to imagine. It could never happen in our lifetime,
could it?

Although such devastation has never occurred within the memory of our civilization, we have been
periodically reminded of nature’s power. Almost a hundred years before the 2004 Sumatra tsunami, in
1908, near Russia’s Tunguska River a comet exploded in the atmosphere releasing energy somewhere
between the equivalent of five and thirty-five tons of TNT. The blast destroyed eight hundred square
miles of forest. If the Tunguska comet would have exploded over a densely populated area millions of
people would have been killed.

What if the Tunguska comet would have been significantly larger? Would it have destroyed our
civilization? How much destruction does it take to erase civilization? If a global catastrophe occurred
today, like the meteor impact astronomers warn us will eventually happen, what would be the impact
on civilization?

The impact on civilization, of course, would depend on the size of the projectile. If the extraterrestrial
body were the size of a planetoid, like the moon for example, nothing of the planet’s surface would be
left. Everything would be scoured down to rock from the energy of the impact. Except for microbes
buried in the Earth’s crust, all Life would be annihilated. A much smaller meteor would still do significant
damage, such as that which ended the Age of the Dinosaurs. Paleontologists are convinced by the
evidence that a six-mile wide meteor impacted in Mexico’s Yucatan peninsula sixty-five million years ago
leaving a crater 112 miles wide and 3,000-feet deep. What effect this size of an impact like this would
have on human populations is unknown; although the fossil record indicates even such a small impact
would be devastating.

No devastating impacts such as this have been recorded in human history but there are scientists,
such as Dr. Stanley Ambrose of the University of Illinois, who believe that a super volcanic eruption
74,000 years ago and wreaked havoc on the planet leaving a crater thirty miles wide and sixty miles
long. According to Ambrose, the fallout from the Toba eruption reduced the human population to as low
as, possibly, a few thousand individuals. This helps geneticists to explain the similarity in all human DNA.
All of us living today are the descendents of a handful of survivors.

If a global catastrophe occurred today, such as Armageddon’s asteroid or the impending eruption of
Yellowstone’s caldera, and reduced the world’s population to a billion people could our technical society
survive? Could the county or state you live in continue with more than eighty percent of its inhabitants
gone?

No one knows for sure what level of reduction society could endure and continue to function in the
manner that we are familiar with. However, studies have been made on the subject although involving a
lesser magnitude of destruction. In 1972, the Office of Technology Assessment, the President of the
United State’s advisory group of scientists, technologists and engineers performed a study on the effects
a limited nuclear war would be. They concluded that the best case scenario is that after the fallout of
destruction civilization would return to a medieval style society.

In 1998, a small preview of such a tragedy occurred in Quebec. An ice storm knocked out power and
demonstrated the frailty and dependence modern civilization has upon its technology. The vital
infrastructure of society - energy distribution for heating, food production, the supply of clean water,
telecommunications, information technology, the transportation of people and goods, hospitals, and
banking – was crippled. Within a few days people were burning their furniture to stay warm.

But what would have happened if the situation was never corrected?

In a worst case scenario, after the dust settled anarchy would immediately ensue then society would
slowly develop into a feudalistic way of life. Any modern equipment that survived would be scavenged
and used as long as possible, but without the manufacturing of replacement parts the equipment would
eventually become useless. For equipment requiring fuel of some type, how long would existing supplies
last? Regardless of how long fuel supplies lasted, over time, the caustic forces of nature would have
their way and any surviving equipment would return to the mineral elements from which it was
originally forged.

According to a recent documentary entitled Life After People, experts in civil engineering and
geology testify to the speed in which civilization’s infrastructure would erode. If the human species were
to succumb to extinction within a few hundred years all building regardless of their composition would
begin to crumble, and after a thousand years there would be little evidence that cities of steel and
concrete ever existed. Only objects made from the hardest rock or the thickest concrete would survive.
Hoover dam may last for tens of thousands of years. But after that only Mount Rushmore and its solid
granite faces would remain.

As for future generations, only the tools necessary to survive and eke out a living would be on their
agenda. Forget about machines and electronics, even paper and pencil. The only tools that would be
worth the time and effort in creating would be those that provided an advantage in the hunt or in the
fields. Those born post apocalyptic would have to begin again and forge a new society. Within a few
thousand years, maybe less, the civilization that once was would be nothing more than a dim memory.
Within ten thousand years all traces of civilization would have vanished.

If there were various pockets of survivors scattered across the globe different civilizations would
begin to emerge, most likely with a culture and language specific to their region. Precisely how long it
would take for these civilizations to emerge no one knows. Nonetheless, they would emerge all at about
the same time for the human being is inherently social and naturally organizes himself into a form that
benefits the group. Once a threshold of manpower was reached specialization would occur. Thus,
civilization would be reborn. Science, trade, education and all the other aspects of civilization would
develop. Eventually, thousands of years later, civilization would reach a level comparable to what it had
been eons ago without ever knowing that the previous civilization ever existed.

For the archeologists of this new civilization, how would they know that such a break in civilization
existed? In what form would the evidence be?

A large meteor impact or the eruption of a super volcano would result in nearly everything being
buried under leagues of ash, as it was sixty-five million years ago in Central America’s Yucatan Peninsula,
or 75,000 years ago with the Toba super eruption.

In the Toba eruption 1740 cubic miles of magma was ejected which covered 200,000 square miles of
land and sea. If the Yellowstone caldera erupted, the continental United States would be devastated
from a blast equivalent to millions of Hiroshima-sized nuclear bombs, of which the long-term
consequences are truly unimaginable. Such an explosion sounds close the cold war’s ‘mutually assured
destruction.’

The toughest of buildings farthest away from ground zero would likely have survived and may still
be standing if not subsequently disassembled for use as materials in new construction by first few
generations of survivors. So would any large monuments carved in stone.
To the new civilization many thousands of years later Rushmore’s embolden faces would be meaningless. So might the English inscriptions within the mountain’s hall of records. With the memory of the civilization that once was sufficiently erased by the necessity of the enduring moment for the surviving generations, for the new civilization would suggest that the heads of Rushmore were carved in relatively recent times by the native population of the Black Hills, even though how they accomplished such a feat remained a mystery.

If not buried in ash, heavy structures made from reinforced concrete would lightly pepper the landscape as if a Johnny Appleseed-type general contractor went on a building spree. But, with their chambers gutted by scavengers and their exteriors plain there would no way of assigning them a history. They too would be designated as structures built by primitive yet extraordinarily resourceful inhabitants.

When the new civilization reached a certain point of sophistication archeologists and historians would assess and reassemble what could be determined about these structures from what records remained. They would also dig into the soil and discover other structures of a similar nature. Without any other evidence to go on, these enigmatic structures might be categorized as part of their religious traditions, just as the more recent ancestors of the new civilization built massive religious structures to honor their God. As all cultures do, the ancient inhabitants who built these majestic temples must have had been motivated completely by religious beliefs.

As years passed by the new civilization became increasingly knowledgeable and their science progressed in unimaginable ways. Such was the progress of the new civilization that life became easy so ample time existed for many to reflect on life, and on history.

Intrigued by the strange structures that lightly peppered the landscape, an expert himself in manufacturing techniques, one man marveled at the skill and precision in which they were erected and at one structure in particular. So, he set out on a journey that lasted nearly a lifetime to explain what he had discovered: the builders of these enigmatic structures, so precise in their construction, must have possessed some type of sophisticated technology. But why would any civilization spend tens of billions of dollars in resources to erect a monument honoring God or King? The unusual passages and chambers within the structure looked as if they were made with a purpose. It had to be a machine or device built by people who used smaller machines and devices. That would account for its size and precision. But it was just a theory and since there was no evidence to compel anyone to believe otherwise it remained on the fringe of historical interpretations.

Although the scenario of global cataclysm presented here is hypothetical it hints at the technical and historical evidence you have read about in this book. One needs only to review the effect of hurricane Katrina on the city of New Orleans in 2005 or the Sumatra Tsunami of 2004 to get a glimpse of how devastating natural catastrophes can be. The effect of a large meteor impact or a super volcanic eruption on civilization would be so vast and so damaging a hurricane or tsunami dwarfs in comparison that a whole new scale of destruction would have to be invented. Yet, in our resilience we humans would likely survive while other species became extinct.

Terminal Pleistocene Extinction

Terminal Pleistocene Extinction is the scientific term for this event. We know it by its common name, the end of the Ice Age which is synonymous with the disappearance of the Woolley Mammoth, Mastodon, saber tooth tiger many other species. In all, Forty-five percent of all mammalian species became extinct.¹

Professor Frank Hibben, one of the pioneers of American archeology who worked from Arizona to Alaska in search of the first Americans puts it bluntly. “The Pleistocene period ended in death.”² And, it wasn’t ordinary. It was “catastrophic and all-inclusive.”³ The evidence could be found almost everywhere – Florida, New Jersey, Texas, California, and as far south as Mexico and South America.
violence of which he compares to scenes of liberated death camps in Nazi Germany, “Such piles of bodies of animals or men simply do not occur by any ordinary natural means.”

Siberia and Europe were equally affected. The European rhinoceros and cave bear, as well as the herds of bison and mammoth in Siberia disappeared forever. The extinction seems to have been an event of the northern hemisphere. Although northern Africa was affected, its southern parts and Australia escaped destruction.

In Alaska, the evidence of cataclysmic death is clear. Frozen deposits of soil, rock, plant and animal remains, known as muck, is a common geologic feature. In many places this muck is “packed with animal bones and debris in trainload lot [including] bones of mammoths, mastodons, several kinds of bison, horses, wolves, bears and lions.” They met their end in the icy waters of monumental flash flood. Professor Frank Hibben also found something he did not expect. Within the frozen muck were parts of animals and trees mixed with chucks of ice interlaced with layers of peat moss. According to Hibben, “It looks as though in the midst of some cataclysmic catastrophe of ten thousand years ago the whole Alaskan world of living animals and plants was suddenly frozen in mid-motion like a grim charade...twisted and torn trees are piled in splintered masses ... at least four considerable layers of volcanic ash may be traced in these deposits, although they are extremely warped and distorted.”

Although more than three thousand miles away, a similar situation exists in Southern California’s La Brea tar pits. A large portion of the bones were discovered “broken, mashed, contorted and mixed in a most heterogeneous mass.” More than five hundred species of animals were fossilized in the sticky black tar some 10,000 years ago. In 1906, after the first season of excavations more than 700 saber-toothed tiger skulls. The tiger skulls averaged twenty per cubic yard. In the tar pits there were actually more bones than tar.

On the other side of the Arctic Circle, mammoths were being killed in the same manner. In 1977, John Massey Stewart estimated that more than 500,000 tons of mammoth tusks were buried along Siberia’s Arctic coastline. In recent times, several dozen frozen mammoth carcasses have been found with their flesh still intact such as the Jarkov mammoth. Other mammoths have been found with undigested grass, bluebells, wild beans, and buttercups still in their stomachs.

Whatever catastrophe occurred also affected human cultures. The brilliant painters of the Magdalenian (Cro-Magnon) culture that populated Western Europe and were responsible for such beautiful works of cave art as Pech Merle, Chauvet, and Cussac seeming disappeared around 13,000 years ago. Their successors, the Azilian culture, appear in the archeological record as scattered communities peppering the land. From an archeological perspective, it is almost as if a dark age began around 16,000 years ago that lasted for the next several thousand years.

Birth of a New Age

How human cultures fared during this period of mass extinction has been as much a mystery as why the global climate changed so abruptly. What is apparent from the archeological records is that between 10,000 and 8000 BCE human cultures began to gather wild cereals and began to establish permanent agricultural settlements.

First discovered at the Wadi en-Natuf just north of Jerusalem, these first farmers were known as the Natufians. They lived in the lands just east of the Mediterranean, the modern-day countries of Israel, Jordan, and Lebanon. Originally the Natufians collected cereal grains and hunted gazelle, but gradually moved to a life in permanent villages.

Physically, the Natufians were of a slight build with a dolichocephalic (oblong) cranium. They wore animal skins for clothes and headgear made from shells and lived in caves or on hilltops close to fresh water springs. As artisans, compared to other prehistoric culture, they left an unprecedented quantity of bone implements and stone artifacts. Natufian were artists and made ornaments from a variety of raw
They were also builders and founded the first city of the new age around 10,000 BCE, Jericho.

Well known for the biblical tale of military conquest, the ruins of ancient Jericho lie in an oasis of the Jordan Valley, north of the Dead Sea. Excavation revealed almost continuous occupation from its Natufian establishment to 1580 BCE. Between 8300 to 7300 BCE, Jericho’s occupants built circular brick houses surrounded by a perimeter wall, and tower west of the city that included an internal stairway, its steps built from huge stone slabs. Rectangular houses with plaster floors and walls were added later. By the sixth millennium BCE Jericho inhabitants had domesticated sheep and were cultivating a variety of plants. By 4500 BCE farming had reached the western edge of Europe.

Sometime during the middle of the sixth millennium BCE another city sprung up east of the Carsamba River on Turkey’s Anatolia Plain, Çatalhöyük. Nearly twice the size of Jericho, at one time Çatalhöyük housed a population close to 10,000 people in an astonishing network of houses and shrines.

Inside the house, ceilings were made of clay pressed into reeds and windows were set at the top of walls near the roof. Floors were created from a lime-based plaster and covered with woven reed mats. Plaster walls were painted with designs in white, red, yellow, and black. Benches and small niches were built along the walls for sitting and sleeping.

In these homes, horns and Bullheads adorned the walls of interior rooms. Female breasts were also sculptured on walls and in some accompanied bullheads formed in high relief along interior walls. Some were genuine skulls covered with clay and baked into hardiness. Several shrines were filled with horns. Benches, where worshippers would sit or lie, were cradled by the huge sweeping horns of the now extinct Aurochs bull. In one dwelling a mural showing the nearby Mount Hasan erupting is the oldest known landscape painting. This scenic painting features the block-style Çatalhöyük settlement in the foreground and a twin-peaked red volcano in the background bellowing smoke from its summit.

Like Jericho, the people of Çatalhöyük farmed and raised animals. The remains of barley, wheat, peas, chickpeas, lentils, and wild legumes, as well as pistachio, bulrush, pepperwort, and hackberry seeds have been found. In the summit area of the excavation a large number sheep and cattle remains were found amidst a smaller number of pig, horse, dog, fox, and hare.

Also found at Çatalhöyük were plenty of personal items, stuff that would be a part of any modern household. Besides obsidian from a nearby volcano for making tools such as blades and projectile points, eighty percent of the glass-like rock went for such items as mirrors. Wood was used to make boxes, bowls, platters, cups and spatulas. Animal bones were crafted into needles, plastering tools, cups, spoons, spatulas, fishhooks, hammers, and handles for blades. Baskets, woven in spiral fashion, were made of straw as were mats for floor coverings. Clay was used for making pots. Numerous clay balls, both large and small, were also unearthed. Although still somewhat of a mystery, they may have been used as heat transfer devices used in cooking.

Domestic life must have been fully developed. Accessories and articles of personal adornment suggest the people who lived there were modern in much the same way we are. Some items appear to be toggles, belt buckles, rings, stone and clay beads, bone pendants, beads for anklets, bracelets, and one exceptional flint dagger with a decorative bone handle. There is also evidence of textile manufacturing, possibly wool or flax.

Since Anatolian trade goods have been found throughout the Middle East, Çatalhöyük must have been a hub for commerce. The city’s occupants most likely traded in obsidian, textiles, skins, food, and even technology. Stamp seals were found of various designs, possibly used to decorate fabric or walls,
but may have also been used to stamp exported products indicating that they were ‘made in Çatalhöyük.’

One of the more eerie practices of Çatalhöyük’s occupants was their burials rites. The practice of excarnation (the removal of flesh) is portrayed in frescoes where the dead are placed in strange, open funeral houses where griffin vultures strip away the body’s soft tissue. One painting displays a vulture with human legs, wings outspread over a small headless figure. Vulture skeletons have also been found in shrines dedicated to the bull where they were embedded in decorative breast made of clay; the beak of the bird creating the tip of the nipple. One human skeleton was excavation precisely as the vulture murals portray, headless and in his grave with his left hand over his genital area. Although thought to be the god of some funerary cult, the vulture and practices of excarnation are still a mystery. One possible explanation is that the practice involved the belief of “sky burial.”

Predating Sumer by several thousand years, Çatalhöyük was the center for the most advanced prehistoric culture in the Near East. Around 5600 BCE the city was abandoned for reasons unknown. What seems odd is the Çatalhöyük culture left no permanent mark on other cultures, although residual elements of their society appears to have been part of the Halaf culture of north Mesopotamia, but they too disappeared.

Some researchers postulate that the mass extinction at the end of the Ice Age spurred the development of agriculture and animal domestication, a necessity for human survival in a changing global climate. Did the climate change also spur the need for relatively modern style homes, and bowls, platters, cups, and spatulas, or belt buckles, rings, and mirrors?

What events brought about the end of the Ice Age and mass extinction ranges from sensational theories of an upheaval in Earth’s crust to gradual climate change resulting from a change in Earth’s orbit. No one knows. It is as if the cataclysm was invisible.

An Invisible Cataclysm

In 1967, the United States military deployed a number of satellites to monitor the Soviet Union and their adherence to the 1963 Nuclear Test Ban Treaty. However, the evidence they gathered was not what was expected. The satellites discovered cosmic rays, gamma ray bursts - the most lethal source of radiation known to man. According to the data, the source for these gamma ray bursts appeared to be nearly everywhere outside our galaxy. At first, colliding neutron stars were suspected and then later the supernovae also became a suspect, emitting more energy in their last few seconds of life than the star’s entire life history. Whatever the source, a concentrated amount of these cosmic rays would to be lethal for us and our planet.

More than thirty years later, on August 27, 1998, NASA’s Ulysses spacecraft, armed with high-energy radiation detectors registered a gamma ray burst from a star named SGR1900+14, located in our own galaxy in the constellation Aquila 20,000 light-years away. At the time, it was the most powerful wave of gamma radiation observed from this type of star, from near zero to several thousand electrons per second. This burst was extraordinary. It was estimated that in a few seconds the Aquila burst released as much energy as our sun would in three hundred years.

Astronomers have named this type of super-large starburst as a magnetar. So dense is this super star, immediately before its explosion its magnetic field is calculated to have been nearly a thousand trillion times stronger than Earth’s magnetic field. These super stars are so intense that they emit a steady stream of X-rays peppered by brief but powerful bursts of gamma rays, and an intense occasional flare.16

Cosmic rays (high energy gamma rays) are not visible, and in general are deflected by the Earth’s magnetic field. But according to NASA, a sufficiently intense gamma ray burst originating in our galaxy within six thousand light years of Earth would be cataclysmic, and possibly a catalyst for mass extinction.17 Gamma rays interacting with the atmosphere would burn away the ozone layer. Although
Earth’s atmosphere would soak up most of the gamma rays, the nitrogen and oxygen molecules in the air would break into a poisonous brew of nitrogen oxides, particularly nitrogen dioxide. Deadly ultraviolet radiation would reach the surface and lead to a widespread outbreak of disease and cancer. Some scientists, such as Arnon Dar, Ari Laor, and Nir Shaviv of the Israel Institute of Technology theorize that these lethal fluxes of atmospheric particles called muons would not only destroy the ozone layer and make the environment radioactive, but for those who survived would suffer their children birth defects from mutated DNA.

According to Dar, after a supernova’s initial burst some of the ejected material would fall back into its core generating a hyper-dense neutron star. An accretion disk (a swirling disk of matter) would develop around the exploded star. Then the material that fell back into the star would be hurled into space in the opposite direction of the star’s rotation. As the ejected matter overtook the material from the initial explosion, a gamma ray burst would be generated. Dar refers to this scenario as the ‘cannon ball’ model and claims there is a growing body of direct and indirect evidence to support its occurrence.

According to University of Kansas astrophysicist Adrian Melott, there is palaeontological evidence that a gamma ray burst in our galaxy occurred at the end of the Ordovician period 443 million years ago, bringing to Earth a mass extinction of animal life. The Ordovician extinction is one of five major extinctions that have occurred in the past 500 million years.

Could it have happened since the Ordovician extinction? A University of Hawaii particle astrophysicist thinks so. According to Professor John G. Learned, gamma ray bursts occur on average every one hundred to three hundred million years.

Astronomers have also discovered that gamma ray emissions can originate at the center of galaxies. In 2000, astronomers from Cambridge University and the Joint Astronomy Centre in Hawaii created the most detailed map of our galaxy’s center. Vast, dense clouds of gas and giant streams of energy serve as a womb for the birth of stars. There is also a wide network of wispy filaments and other strange structures formed by the intense stellar winds and magnetic fields. And at the very center of the core there lays a monster known as Sagittarius A*, the remnants of an explosion a hundred times more powerful than a supernova. Astronomers have dubbed this ultra-super explosion as a ‘hypernova.’ Although no one knows for sure what Sagittarius A* is, it is believed by some astronomers to be a supermassive black hole.

Although it is yet to be proven that a single galaxy has a black hole at its center, the possible galaxies that might contain a black hole is on the rise. Some galactic cores emit vast energies and are much brighter than others. These high energy galaxies are said to have an ‘active galactic core’ and thus are labeled as active galaxies.

Active galaxies are believed to have a supermassive black hole at their core that hurls into space tremendous jets of energy, and through the production of a black hole gamma ray bursts are created. When a large star explodes its core collapses and a black hole forms; the explosion sends a blast wave through the body of the star. When the blast wave collides with material within the star’s body, gamma rays are created and burst out from the star’s surface in front of the blast wave. The blast wave and its cache of stellar material, then rockets through space near the speed of light. As it travels it collides with gas and dust and emits even more photons which results in an ‘afterglow,’ and would have a distinct color blue.

Our galaxy is inactive, but if it ever became active through the creation of a newly formed hypernova its telltale sign would be ominous. Cosmic rays emitted from the core, as a superwave, would be visible as a large blue star in the night sky. A thousand times brighter than the brightest star in the sky, it would be unmistakable and a warning of impending doom.

According to physicist Dr. Paul LaViolette, the core of our galaxy emitted a burst of cosmic ray electrons and electromagnetic radiation around 16,150 years ago. Its effects spanned a period of time lasting several thousand years and triggered vast increases in solar flare activity. Some of these intense
coronal mass ejections would have been large enough to temporarily engulfed the Earth and Moon.\textsuperscript{25} For Earth, the consequences were cataclysmic: a sudden increase in temperature, rapid ice sheet melting, global flooding, and the mass extinction of animal life.

Other, independent evidence appears to support such LaViolette’s theory. In 1977, after studying moon rocks NASA astronomers published an article entitled “Solar Flare Activity: Evidence for Large-scale Changes in the Past.” Their conclusion was that prior to 10,000 years ago solar flare activity must have varied as much as fifty times what it has been in the last 10,000 years. Although they “somewhat qualified” their theory, they were confident that “the conclusion nevertheless remains the present ‘best’ explanation for the observed data trends.”\textsuperscript{26}

NASA physicist for the Johnson Space Center, Herbert Zook appeared in the documentary “Earth Under Fire” in support of LaViolette’s theory. He concluded “that there is rather good evidence that the sun was more active, possibly much more active, 10,000 to 20,000 years ago.”\textsuperscript{27}

**The Carbon-14 Anomaly**

If a galactic core burst sent gamma ray radiation speeding through our galaxy at the sometime in the past it would have affected the biology of our planet and left its fingerprint as a part of the archeological record. How this fingerprint would appear would be through the release of neutrons, which would dramatically increase the amount of carbon-14 in the atmosphere. In turn, excess carbon-14 would show up in biological remains like wood and bone, as well as other organic material from that period of time.

Carbon-14 is created when the reaction of cosmic rays with the ionosphere precipitates neutrons through the atmosphere. These neutrons react with nitrogen-14, creating carbon-14, which immediately upon creation begins to decay.

Organic material absorbs carbon-14 at a constant rate, and, knowing what the level of carbon-14 in an object was before it died, scientists can measure the amount remaining and calculate its age. Apart from normal variations, carbon-14 stays at a constant level in the Earth’s atmosphere. However, modern nuclear activities have increased the level of carbon-14 in the atmosphere, and subsequently in everything organic.

When Willard F. Libby first discovered radiocarbon dating in 1947 archeologists and Egyptologists ignored it. They questioned its reliability, as it did not coincide with the known historical dates of the artifacts being tested.\textsuperscript{28} Today, carbon-14 dating is an accepted practice. However, the radiocarbon time scale contains uncertainties, and errors as great as 2,000 to 5,000 years, possibly a result of contamination. Willard Libby addressed the problem of contamination, and the ability to distinguish between the chemistries of life and death (the chemistries of death being the contamination). So, washing techniques were then developed to separate the two.

Egyptologists generally agree upon the established chronology of ancient Egypt’s dynasties. Consequently, when radiocarbon dating returned results showing artifacts to be between two hundred and five hundred years younger than their established historical dates, they were not impressed. Articles with a known date of 5,000 years were tested and, according to radiocarbon dating, were found to be only 4,500 years old. For instance, pieces of wood that were found in King Tutankhamun’s tomb historically dated at around 1350 BCE, gave a carbon-14 reading of 1050 BCE.

Then a troubling issue occurred. The further back into history carbon-14 researchers went, the larger the discrepancies became. The original assumption on which carbon-14 dating was based was that its level in the atmosphere is the same at all times. Egyptologists and the carbon-dating scientists were, therefore, in contradiction with each other, and neither the Egyptologists nor the archaeologists would budge. So, scientists were forced to re-evaluate their findings and search for an accurate method of calibrating carbon-14 to validate its usefulness.
The answer came in the form of tree-ring dating. The tree that eventually provided the means to accomplish this accurate carbon-14 dating was the bristlecone pine of the southwestern United States. As the oldest living tree on Earth, the bristlecone pine enabled scientists to develop the chronology to calibrate carbon dating and adjust the clock. As it turned out, the Egyptologists and the archaeologists were correct in their dates and the original carbon-14 results were in error. In some cases, for distant dates, the error was as much as eight hundred years. But this finding had more than one interpretation. The Egyptologists may be correct in their historical timeline; or there may have been an unexplained infusion of carbon-14 into the atmosphere at some prehistoric time.

Archeologist David Wilson summed up the argument this way: “If present day measurements of the radiocarbon remaining in objects which died in, say, 2500 BCE give a date of 2000 BCE, then there is ‘too much’ carbon-14 left that is not decayed, perhaps it is that there was ‘too much’ carbon-14 in the object originally in 2500 BCE. This is now generally accepted as being the case, but that still leaves the question open as to why there was more carbon-14 in the atmosphere and biosphere.”

One way to explain the excess carbon-14 is to hypothesize that an immense nuclear explosion occurred prior to 10,000 BCE releasing vast amounts of neutrons into the atmosphere. This would most assuredly result in an elevation of carbon-14. But, to the best of our knowledge no civilization existed with nuclear capabilities at any time in the past. The only other way to explain the evidence is by intense cosmic rays from a coronal mass ejection, which in turn might have been triggered by a galactic core burst. According to LaViolette, such a shower of thermal neutrons would have “changed nitrogen in [animal] remains into carbon-14.” Any exposed organic matter at the time of the solar conflagration would have been made artificially young, from a chemist’s perspective.

Archeological anomalies appear to support this cosmic ray scenario. According to nuclear physicist Richard Firestone and Archeologist William Topping, animal remains found in the northeastern region of North America from the Pleistocene are younger, sometime as much as 10,000 years, than what is found in western areas of the country. Some dates are seriously incorrect, such those from the Gainey site in Michigan. Carbon-14 dating places the material at 2,880 year old, where thermo luminescence (TL) dating shows that the item is 12,400 years old. This evidence prompted Firestone and Topping to write an article entitled “Terrestrial Evidence of a Nuclear Catastrophe in Paleoindian Times.”

According to the article, North America was bombarded with cosmic particles with the heaviest concentrations in the region of the Great Lakes thereby creating “a catastrophic nuclear irradiation that produced secondary thermal neutrons from cosmic ray interactions.” The energy released on this occasion was so great that the atmosphere over the state of Michigan reached 1832 degrees (1000 C.), which melted vast amounts of glacier ice. As for animal and plant life, the radiation would have been lethal.

Firestone and Topping have continued their research and theorize that a 6.5 mile wide comet, possible resulting from a supernova, exploded over the Midwest 13,000 years ago. Furthermore they added, “This event was preceded by an intense blast of iron-rich grains that impacted the planet roughly 34,000 years ago.” More recently, there theory has been published in the academically prestigious Nature Magazine.

Two other archeologists have reported similar dating results. In 1999, Robson Bonnichsen and Richard Will reported in Ice Age Peoples that thirteen prehistoric sites in the northeast United States all arrived at carbon-14 dates regarded as being too young. According to Mammoth Trumpet writer James chandler, “Many anomalies reported in the upper U.S. and in Canada cannot be explained by ancient aberrations in the atmosphere or other radiocarbon reservoirs, or by contamination of data samples (a common source of error in radiocarbon dating).
The editors of Mammoth Trumpet were so fascinated by the story that they reprinted Firestone and Topping’s article in its entirety. Firestone and Topping’s conclusion was that “the only phenomenon capable of creating such imbalances, they argue, is massive neutron bombardment, probably from a supernova.”

Data obtained from polar ice cores also reveals evidence of this cosmic event. During 1981 and 1982, using neutron activation analysis, Dr. LaViolette found high levels of iridium and nickel samples.
from Greenland ice that was between 35,000 to 73,000 years old. Five years later, Glaciologists discovered beryllium-10 isotope peaks in ice-age polar ice, more evidence that cosmic ray bombardment was very high on occasion during prehistoric times.

In *Earth Under Fire*, Dr. Paul LaViolette paints a detailed, ominous picture of the events for this invisible catastrophe. Whether from a black hole or mega-star, the core of our galaxy periodically becomes active and enters an explosive phase generating a burst of cosmic radiation that lasts for several hundred to several thousand years. According to LaViolette, our galactic core bursts a volley of gamma rays about once every 13,000 and 26,000 years. This cosmic superwave of energy travels out from the galactic core close to the speed of light, and on its 23,000-light-year journey toward Earth it would be beaming forward a blue light.

When the cosmic rays reached the outer shell of the solar system, (the magnetic field shield from solar wind generated by the sun) a luminous filament of web-like structures would appear to emanate from the blue star. According to LaViolette, a shockwave would then form producing a longitudinal gravitational wave traveling ahead of the cosmic superwave. Electrons of the superwave would become trapped and vaporize ice of the Oort cloud. This shockwave would then push dust and gas from the Oort Cloud into the inner regions of the solar system altering the levels of solar radiation that reach the planets.

The immediate effect on Earth would be the arrival of an electromagnetic pulse (EMP). Shortly afterwards, a large gravity wave would move through Earth pulling the planet at its seams (tectonic plates) resulting in a rash of earthquakes. Darkness would follow as cosmic dust and debris from the outer shell of the solar system reached the inner planets. In the dust, the sun would react violently and behave like a T-Tauri star emitting excess x-ray, ultraviolet, and infrared radiation. Solar flares would also be a result and increase the sun’s brightness several percent.

Over time, the cumulative effects on the Earth’s climate would be devastating. Dust that filled the solar system would reflect radiation back to the Earth, and in effect create a ‘hothouse.’ The gaseous clouds than surround the galactic core would become luminous from the cosmic radiation and form an oval shroud around the blu star. For those on Earth, it would appear to be a blue eye in the sky, a sign of cosmic punishment. Those who survived the radiation burst would suffer through devastating environmental changes. People living in coastal areas would suffer destructive floods. But more importantly, with the intense heat weather patterns would become unpredictable, and the air would become almost toxic as nitrogen and oxygen broke down into brown smog. Famine would be the number one killer. Only people who were fortunate enough to be near water and a ready supply of food would survive.

**Civilization X**

A gamma ray burst around 14,200 BCE that sparked a chain reaction of catastrophic events answers to a number of questions concerning history, particularly various myths of mankind’s decimation, such as The Eye of Ra, the Epic of Gilgamesh, Noah’s Flood, and Deucalion’s Flood. It also offers a plausible answer to the ancient tradition of the separation of ages into post and antediluvian. There is also an explanation for the mass extinction and sudden global warming at the end of the Ice Age; as there is an explanation for the enigmatic and anachronistic structures of Egypt’s granite civilization.

A previously unknown civilization existed before the end of the Ice Age with the technical know-how to build on an extraordinary scale with limestone and granite, and to build with the precision of modern manufacturing. Not only did they build with skill, but with purpose in the network of energized pyramids that fertilized their fields. The existence of such a civilization explains the evidence from the magnificently carved granite statues of Thebes, Memphis, and Tanis to the monumental pyramids that line the west bank of the Nile in Lower Egypt. It also explains the stone at Abu Rawash Christopher Dunn so eloquently describes as the waste material of a casing stone created from a circular power saw.
The Stone at Abu Rawash

The most fascinating aspect in this detective story of Earth history and our history is that the survivors of this civilization would never forget the celestial changes that brought about disaster.

The glow of the galactic core, the blue star, would have been visible for some time. And when the cosmic superwave made its way past the outer rim of the galactic core, dense gas clouds created a luminous oval around a Blue Star. In the night sky, it really would look like an eye, the Eye of Ra. And in the daytime it would appear as a second sun, in size and brightness. This site of this blue eye would have been incredible. The entire eye would have been as big as 32 times the size of the sun and the eye's pupil, 4 times the size of the sun.

Now, in this striking passage from an ancient Egyptian incantation, we can clearly connect the metaphorical to the literal:

"Great will be your power and mighty your majesty over the bodies of your enemies. They will fall howling on their faces, all mankind will cringe beneath you and your might, they will respect you when they behold you in that vigorous form which the Master of the Primeval Gods gave you ..."

Look ... O Primeval Ancestors! upon this spirit who comes today, taking the form of a beam of light, coming from the Isle of Fire...

"I have to raise my hand to shade myself, for fear of the fire of her mouth," says one of the elder gods.

"Behold it (the Eye) will be stronger than all the gods, It has mastered the dwellers at the ends of the Earth, it is sovereign over every god."

...No one will come who can withstand me, except Atum, for it was he who originally moved and put me before him so that I could wield power and throw out my heat.

Considering the impact such an event would have had on civilization, along with an illumination of the galactic core, no wonder it inspired ancient myths about mankind being punished by the cosmic Eye of Ra. Civilization as they knew it had been destroyed. No wonder the survivors systematically removed Hathor's face from her temple residence, as Amelia Edwards describes:

"It is not without something like a shock that one first sees the unsightly havoc wrought upon the Hathor-headed columns of the facade at Denderah. The massive folds of the head-gear are there; the ears, erect and pointed like those of a heifer, are there but of the benignant face of the goddess not a feature remains." Even on the ceiling "every accessible human face, however small, has been laboriously mutilated."

The original Temple of Hathor at Denderah was built long before the first Egyptian Dynasty. As do all the other precision crafted structures of ancient Egypt, the intricate and precision construction of the hypostyle hall and flowing locks of Hathor’s hair on its capitals attests to the work of this Civilization X.

On the ceiling of the temple there is a beautifully carved zodiac presenting the Egyptian constellations in a polar projection format. The symbols for constellations are symmetrically oriented around the celestial polar axis, and the zodiac symbols around the ecliptic pole. What is interesting about this zodiac carving is that the summer solstice is oriented to true north, and the spring and autumnal equinoxes oriented due east and west.

According to LaViolette, the carving’s depiction of polar displacement (a result of precession) and its appropriate orientation relative to true north, suggests that whoever designed the relief understood astronomical principles and was using precession of the equinoxes to indicate the key date of 13,0687 BCE, give or take twenty years.
So, the Denderah zodiac is much more than an artistic display of the zodiac and its constellations. It is a map pointing to a specific date nearly 15,000 years ago. Interestingly, a special hieroglyphic designates this key date by being positioned on the celestial equator close to the summer solstice transect. The marker is, of course, Hathor, the cow of Isis adorned with a star.

Dr. LaViolette also points out uniqueness about the ancient zodiac signs. Sagittarius and Scorpio are the only signs in the zodiac depicted with arrows. For Sagittarius it is the arrow of the archer, and for Scorpio it is the tail of the scorpion. Sagittarius and Scorpio are also adjacent to each other as if intentionally pointing at the galactic center. Today they miss the galactic center by 2.5 degrees of longitude. However, 15,870 years ago they pointed directly toward the center of the galaxy. Ironically, this division between post and pre-catastrophe is strikingly close to the time when the Shemsu-Hor (the Followers of Horus) began their reign in Egypt, 14,800 BCE.

Could it be that Egypt’s mythical time period when the gods reigned is in reference to a dim memory of a great civilization, and that the Shemsu-Hor are the survivors of the cataclysm that ended the Ice Age? Perhaps this is the essence of the tale the Priests of Sais told Solon that Plato spun into a story of morality and Nature’s wrath. The story of Atlantis carries the same theme.

There are no historical records, or what might be interpreted as records, prior to 3000 BCE to help explain any human events that may have occurred at the time of the terminal Pleistocene Extinction. But, as has previously been addressed, there is the ancient Egyptian’s Kings List, a record of all Egypt’s past rulers according to their history. Despite the dissatisfaction of modern Egyptology to the concept of a dynastic race, the ancient Egyptians also support the existence of a dynastic race in a history that reaches into the past 40,000 years.

For post apocalyptic generations only a dim memory existed of their ancestor’s grand civilization, and with all their great achievements labeling them as ‘the gods’ would be appropriate. And their descendents, the survivors, after 14,000 BCE would have carried forward that civilization’s culture as best as possible. The Shemsu-Hor, the Followers of Horus, with their knowledge and skill passed down for thousands of generations would be viewed as a ruling class, a dynastic race.

Diodoros of Sicily reports history in a similar manner. According to several chroniclers, gods and heroes originally ruled Egypt for 18,000 years. Afterwards, mortal kings governed for 15,000 years. This brings the length of history to 33,000 years. Manetho attributes 15,150 years to prehistoric divine dynasties and 9,777 years to the kings reigning before Menes, a total of 24,927 years.

According to Wallis Budge in A History of Egypt, George the Syncellus claimed that the Egyptians possessed a tablet they referred to as an ancient chronicle which mentioned thirty royal dynasties after the reign of the gods. This comprises a period of twenty-five Sothic cycles which is 36,525 years, one Sothic cycle being 1,461 years.

Herodotus also mentions a long history for ancient Egypt in that, on four separate occasions “the sun moved from his wonted course, twice rising where he now sets, and twice setting where he now rises.” According to Herodotus, which Herodotus tells us was according to the Egyptians and the Egyptians priests, from the current King, Hephastos, to the first king of Egypt there had been 341 generations of men. And since three hundred generations are equal to 10,000 years, given a hundred years is three generations of men, 11,340 years has passed from the first king to Hephastos. During that time, the Egyptians said, “there had arisen no god in human form; nor even before that time or afterwards among the remaining kings who arise in Egypt.”

Herodotus was taken by the priests to a great temple and shown colossal wooden statues representing 345 men who served as chief priests during the 341 generations of kings. Each statue was a son succeeding his father. The priest, going from image to image, told Herodotus their names until he had reached the one who had died last.

The Egyptian priests also claimed that:
The Stone at Abu Rawash

In this time they said that the sun had moved four times from his accustomed place of rising, and where he now sets he had thence twice had his rising, and in the place from whence he now rises he had twice had his setting; and in the meantime nothing in Egypt had been changed from its usual state, neither that which comes from the earth nor that which comes to them from the river nor that which concerns diseases or deaths.⁵⁰

Thus, according to the ancient Egyptian’s records the spring equinox had twice been located in the constellation of Aries, and that it also passed twice in the opposing constellation of Libra. In other words, one and a half precessional cycles occurred during all of ancient Egypt’s historic and prehistoric periods, approximately 39,000 years.⁵¹

As Manetho claimed and the Palermo stone and Turin Papyrus recorded, Herodotus also claims. Before the reign of kings that the priest spoke of “before these men they [the priests] said that gods were the rulers in Egypt.”⁵² Although Egyptologists today would surely object to a history of Egyptian that dates far into prehistory, earlier finds by archeologists appear to corroborate such antiquity. University of Southern California Professor Walter Wallbank, the 1951 winner of the Watumull Prize for *India in the New Era*, wrote in his world history textbook co-authored with Alastair Taylor that:

Artifacts have been discovered in Egyptian tombs that go back as far as 15,000 B.C. These remains show that the early Egyptians passed through the main divisions of the Old and New Stone Ages and had even begun to use copper for tools before the time of the Old Kingdom. Progress was apparently rapid, and soon people lived in crude houses, had weapons of flint and copper, and engaged in agriculture. Examinations of grain and husks found in the stomachs of corpses in ancient tombs has shown that as early as 10,000 B.C. the ancient Egyptians had developed superior strains of barley seed which could be easily cultivated and which produced heavy yields. The earliest Egyptians, whose race has not yet been conclusively ascertained, wore linen garments and were especially remarkable for their artistic skill, particularly in pottery. Their polished red and black ware was never surpassed by their descendents, even in the periods of highest Egyptian accomplishments.⁵³

The textbook, from which this section of text appears, *Civilization: Past and Present*, is still published today, although unlikely in its current edition to exhibit such claims that grain and husks found in Egyptian corpses date to Paleolithic times. Yet, such a claim is consistent with the ancient Egyptian’s professed history.

In order to explain Egyptian history and reconcile it with evidence of a megalithic granite civilization, a logical deduction is that the Egyptian ‘Followers of Horus’ re-occupied the buildings their ancestors erected and attempted to continue a post-apocalyptic civilization. Although this dynastic race gradually lost its skill for a lack of manpower, early on, with the catastrophe fresh in their minds wouldn’t such a powerful and advanced civilization leave a permanent record for their posterity?

The people of the United States did at Mount Rushmore without the affliction of cataclysm. Not only is there gargantuan granite faces of Washington, Jefferson, Lincoln, and Roosevelt but there is also a Hall of records behind the mountain. According to geologists, Mount Rushmore will outlast all other structures and should be visibly intact for the next 200,000 years.

Gutzon Borglum, the artist and designer of the Mount Rushmore project, originally wanted to include a Hall of Records chamber eighty feet deep and a hundred feet wide. It entrance was to be twenty feet high and twelve feet wide with a eight hundred step granite staircase from Borglum’s studio to the Hall’s entrance behind Lincoln’s face. In this hall, the government could store documents such as the United States Constitution and the Declaration of Independence, and statues of America’s greatest
A Case for Civilization X

heroes. Later, he decided to engrave the most important documents on the walls of the record chamber.

In 1938, Borglum begun work on the hall and within a year had cut a seventy-foot tunnel into the mountain. However, with an impending war in Europe Borglum was encouraged to finish the Presidents faces. After the war began funding nearly disappeared and in March of 1941 Borglum died in Chicago after surgery. Although the Borglum family tried to revive an interest in the Hall of Records it wasn’t until 1998 that the National Park Service.

The chamber was never finished but a titanium vault containing sixteen porcelain panels was placed in the entrance’s granite floor. The panels contained the United States Constitution, the Declaration of Independence, a history Mount Rushmore, and histories of the four Presidents as well as a short history of the United States and Gutzon Borglum’s biography.

Could there be an Egyptian Hall of Records?

In one of his ‘readings’ Edgar Cayce stated so, underneath the right front paw of the Sphinx. Although the area under the Sphinx has never been excavated, according to Dr. Schoch’s 1991 seismic survey there is a rectangular chamber underneath the front paws. Whether or not we will ever know depends upon the Egyptian Supreme Council of Antiquities. Nevertheless, there may have been more than one Hall of Records.

Denderah’s Crypts

The builders of Hathor’s temple also saw fit to bury treasure. Not in the form of gold bars or diamonds but information. Before any structures were ever erected at Denderah the temple grounds were excavated and subterranean vaults installed. Today, these vaults are known as ‘crypts.’ Three crypts were created, one for the east, west, and southern exposures of the main temple. Only the southern crypt is open to the public. The other two crypts are restricted and public access denied.

Accessing the southern crypt is not easy. There is no designed formal entranceway. Only a square hole in the floor as if a floor block was never installed, or removed by some explorer long ago. So, access to the southern crypt is through a three-foot square opening. Inside, the crypt is equally narrow and appears more like a hall than a room. All of its walls are carved in relief with murals. Unlike the mural of Hathor carved into the temple ceiling, the crypt murals contain mysterious life-size figures of men and women.

One of the more notable murals is the now famous ‘Denderah light bulbs.’ The strange carving exhibits two men facing each other, each holding a large object shaped like a giant light bulb, but more elongated. At the back of the bulbs a chord is attached that runs along the floor into a box. Inside each bulb is a serpent with its tail at the base of the bulb where there appears to be a socket. The serpent’s head reaching near the bulb’s tip as its body stretches the length of the bulb. The end of one bulb is propped up on a djed pillar. There is also a baboon-looking human figure holding two knives in his hands standing in front of a bulb.

The closest modern visual representation to these ‘Denderah bulbs’ would be a Crookes tube. However, some Egyptologists believe these bulbous objects are of a mystical and religious nature and that the ‘bulb’ is really a lotus flower spawning the primordial serpent from within.

The official explanation for these crypts is that they were storage vaults for statues of Hathor and other ritual furnishings for celebrations. Carvings in the main temple’s staircase depict scenes of rituals that were held for statues at various times of the year. The bulbous carvings are nothing more than a mythical depiction of the lotus flower spawning a snake.

Denderah’s Temple of Hathor, like most temples, was used over a very long period of time. Since everything is relatively old for us the separation between different periods of construction may be hard to tell. But, there is little doubt that the temple was used as a place of worship during later times, and the crypts may have been used to store statues. Yet, its original construction must have been for
something much more important. A cellar only four feet across adorned with carved murals defies logic, except if the purpose of the cellar is to conceal and protect. But what would they be attempting to conceal and protect?

The official view is that they were designed to hold secrets of the prophets and the goddess herself. And the fact that they were beautifully carved and painted the crypts must have been used for sacred rites of Hathor. However, if the story told in the crypts is the same religious and philosophical concept that is told by the architecture and art in the temple of Amun-Mut-Khonsu why were the crypts completely concealed?

The secret has to be something else. Was it technical information and the story of a grand civilization in a time when ‘the gods’ reigned? Were they leaving a message for future generations to find? Are the Denderah crypts a time capsule in the same way Gutzon Borglum designed the hall of records? If mankind was decimated today would the next civilization ten thousand years from now understand English?

The underground structures of ancient Egypt have always been attributed to religious and burial rites. While it is certain that the ancient Egyptians buried their deceased underground there are blatant inconsistencies with this approach. It makes little sense to have carved the underground tunnels of the Serapeum simply to bury a bull. Likewise, it is senseless to carve a tomb in the side of hill that has in excess of 122 rooms, as the Egyptians did with KV5.

Like the megalithic granite and limestone surface structures of ancient Egypt, the massive network of tunnels in the Kings Valley, and at Sakkara, may have already existed when dynastic Egypt was established. One theory to explain the ancient Egyptians great need for underground structures is that during the initial stages of the gamma ray event that brought conflagration and mass extinction to Earth they built sanctuaries underground in order to survive – fallout shelters.

As far as the dynastic Egyptians were concerned 10,000 years later why not take advantage of these already built ‘tombs’? No one else was using them. These underground tunnels built at various ancient sites are almost as big a mystery as Egypt’s granite enigma.

The Granite Enigma

From the sparkling granite columns of Abu Sir to the magnificent curved granite ashlars on the Giza Plateau and the giant granite pillars fluted and incised with hieroglyphs of Giza’s unknown temple, although remnants they testify to a grand civilization that had developed the technology and the industry to build with granite on a massive scale.

The people that created this civilization of granite were masters of its manipulation, and have never been outdone in their accomplishments. Certainly, dynastic Egypt’s granite sarcophagi, sculpted through pounding and adorned with hieroglyphs, were made for burials. However, in contrast to the pink granite boxes such as the two still in place as Abu Sir or those in the Serapeum, the workmanship of burial boxes in later dynasties were significantly inferior.

The most perplexing aspect of the expertly crafted granite box is not just the cutting expertise required to produce them. More than a few that have been discovered, and some even though sealed shut, when opened were found to be empty.

In 1925, upon excavating one of the satellite pyramids of the Great Pyramid, George Reisner discovered a shaft that had not been disturbed. After months of work to clear the chamber at the bottom of the shaft, a party of distinguished visitors and government officials attended the opening ceremony. Unfortunately, when all the distinguished visitors and officials had been lowered into the chamber and the granite lid pried open there was no mummy. In fact, the granite box was completely empty.  

According to Egyptologist Barbara Mertz, know a famous novelist, what puzzled Reisner was why the elaborate care and secrecy had been expended on the burial for an empty sarcophagus. Yet, Reisner
insisted that it had been used for a burial, the discoloration in the bottom of the box proved as much. The difficulty with this theory, according to Mertz, is that other sarcophagi have been found in place, unopened and empty. The Unfinished Pyramid at Zawaiyet el Aryan, which was supposed to be a step pyramid of considerable size, also contained a brilliantly finished alabaster sarcophagus, complete with its so-called funeral straps. Upon opening it was also empty. Interestingly, the work on the pyramid’s superstructure was never started.

In 1953, aerial photographs discovered a rectangular shape on the sands close to the Step Pyramid at Sakkara. After being excavated by an Egyptian archaeologist another step pyramid that was never completed was discovered. The structure from the aerial photograph turned out to be an enclosure wall. Based upon the two courses that had been completed, the pyramid would have been as big as the Step Pyramid. Within it were one hundred-twenty store rooms in the upper part of the structure that contained vases, jar stoppers, and gold bracelets. But the unfinished pyramid also contained an unusual granite box. This one had a sliding panel at one end, instead of a lid that fits on top of the box. And, it was sealed with plaster. In May of 1954 the box was opened and, like other sealed granite boxes, it was empty. Whatever had been placed inside them, if anything ever was, had been removed, but when and by whom? Why spend the time and trouble to carve a granite box, and then seal it while it is still empty? Perhaps the true story of the granite boxes will forever remain a mystery of Civilization X.