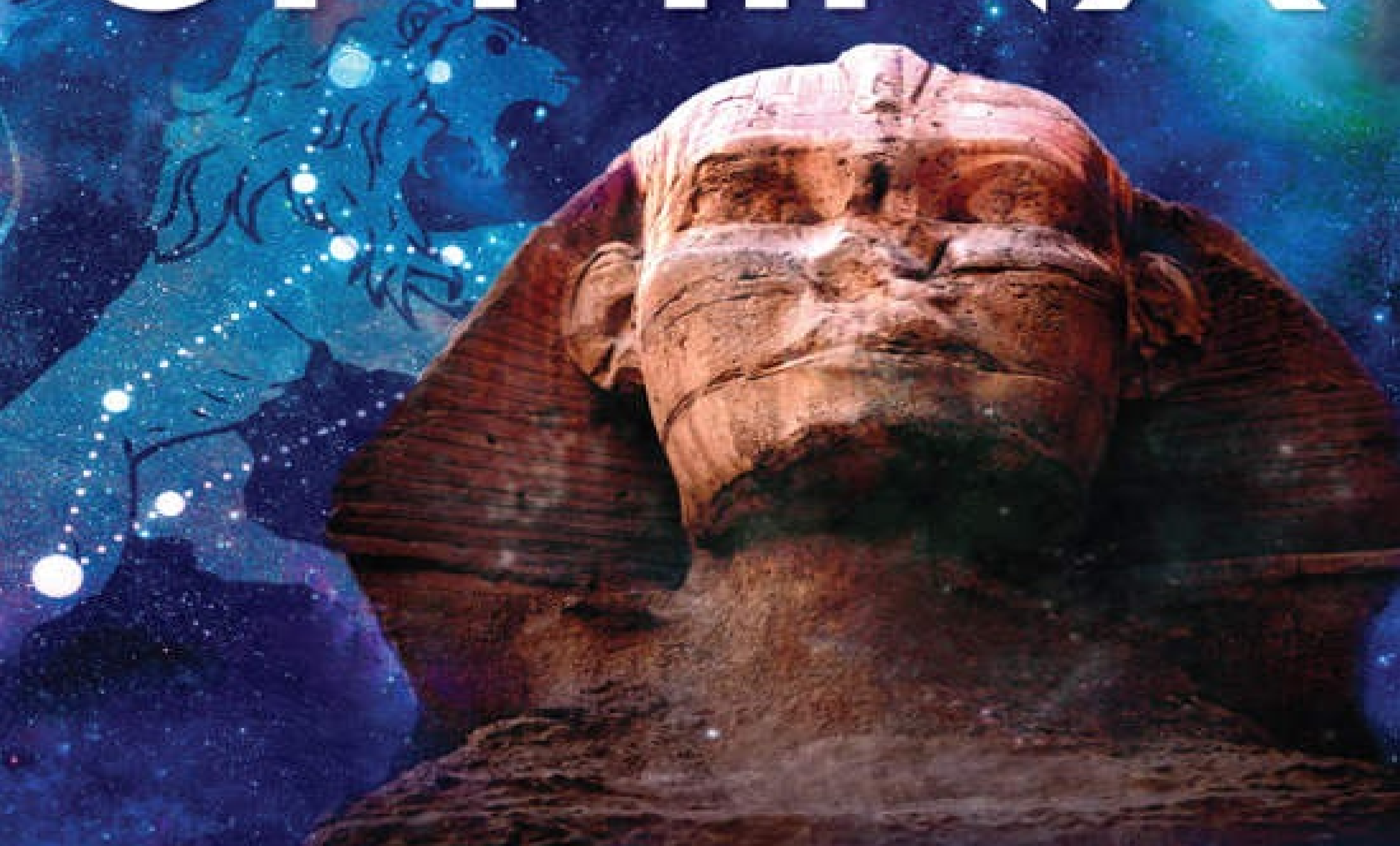
ORIGINS OF THE SPHINX



Celestial Guardian of Pre-Pharaonic Civilization

ROBERT M. SCHOCH, PH.D.
and ROBERT BAUVAL

ORIGINS OF THE SPHINX

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Inner Traditions
Rochester, Vermont • Toronto, Canada

We dedicate this book to our friend and colleague, John Anthony West—a courageous soul.

ORIGINS OF THE SPHINX

"For a quarter-century, Schoch's analysis of weathering at Giza and Bauval's archaeoastronomic discoveries have challenged the consensus on prehistory, not merely of Egypt but of the world. This book expertly summarizes their case and its triumphant vindication in the 12,000-year-old sanctuary of Göbekli Tepe. The question is no longer whether they are right but where archaeology should go from here."

JOSCELYN GODWIN, AUTHOR OF *ATLANTIS AND THE CYCLES OF TIME: PROPHECIES, TRADITIONS, AND OCCULT REVELATIONS*

ACKNOWLEDGMENTS

As always, my thanks go first to my lovely wife Michele, whose loyalty, support, and love have remained unflinching during the four decades we have shared so far. I also would like to thank my two children, Candice and Jonathan, for enduring "yet another book" project by their pleonastic dad. Thank you, too, to David Rohl, Gary Osborn, and Jean-Paul Bauval for enlightening discussions on the fascinating topic of the Giza monuments. To many old and new friends, too many to name here, thank you for your support. Special thanks go to Roberta Comuni, Richard Fusniak, Andre De Smet, and Robert Dakota. To the great team at Inner Traditions: Jon Graham, John Hays, Mindy Branstetter, Patricia Rydle, Eliza Burns, and Manzanita Sanz, thank you for making this book an item to be proud of.

ROBERT BAUVAL, TORREMOLINOS, SPAIN

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ROBERT M. SCHOCH,
BOSTON UNIVERSITY, BOSTON, MASSACHUSETTS

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PREFACE

Robert M. Schoch

The idea for this book originated in Bulgaria. It was late July 2014. Robert Bauval and I had been invited to study various ancient megalithic structures in the Rhodope Mountains, fieldwork that was subsequently highlighted in a documentary produced by Bulgarian National Television, which aired in February 2015. While having a meal on the outdoor terrace at the Momchilgrad Hizhata MG Hotel Complex, Bauval suggested to me that together we should write a book on the Great Sphinx. I immediately took to the idea.

The Great Sphinx, that magnificent and iconic monument, arguably the greatest and most recognizable statue on the face of the planet, has been central to each of our lives for decades. Independently of one another, although we have been friends for many years, we have studied the monument from different perspectives, yet we converge on the same conclusion—that there is something severely amiss with the standard Egyptological story of when and why the Sphinx was carved. It made good sense that we should bring our analyses together between the covers of a single volume.

This book is a true collaboration, but it is also the product of two different scholars with different backgrounds, training, and experiences. We decided that it would be best, truest to our personal integrities and points of view, to keep the authorship of each chapter and appendix separate and distinct. Thus, you will find two different voices, chapter to chapter, as you read. We believe that these voices harmonize and combine together in a complementary fashion. Likewise, in a few cases there is some slight overlap where similar themes and significant features are visited and discussed by each of us, again from our own perspectives and each confirming the work of the other. For the scientist and scholar, confirmatory analyses are relished and are the sine qua non of good research. To accompany our words you will find a number of photographs and other illustrations, including various antique images showing relevant details that are now obscured or totally lost to time.

We have also provided various appendices, which strengthen the text and delve into certain details that are too technical or too obscure to be included in the main body of the book. Each of these appendices can be read on its own as a stand-alone article (and indeed several were originally written as such); however, they also complement one another and the chapters of the main text. With the appendices the thoughtful reader has the material to delve deeply into, and evaluate, the evidence on which theories of the Sphinx are based. In essence, with this book we have provided you, the reader, not only our analyses and conclusions, but also much of the essential data and the conceptual tools to come to your own conclusions. As is the case with many things in life, the more energy you put into something, the more you are likely to get out of it. With this in mind, you can approach this book as a "good read," focusing on the chapters, or as an intellectual challenge, digging deep into both the main text and the appendices. Either way, our desire is that you will come away from this book with new insights and revelations regarding the Sphinx.

Fig. P.1. The authors, Robert Schoch (left) and Robert Bauval (right), enjoying a healthy snack while in the field in Bulgaria, July 2014.
(Photo courtesy of R. Schoch.)

Chapter One

THE GREAT PARADOX

Robert Bauval

It has been the theme of poets, painters, musicians, theologians and historians, and yet in spite of all that it remained the silent mystery of the ages, the Great Paradox, being at once the best known and the least known of all the monuments in Egypt.

SELIM HASSAN, EGYPTIAN ARCHAEOLOGIST, 1953

The exact period of construction, or better still creation of the Great Sphinx, is still one of the great enigmas of the Egyptian art history.

RAINER STADELMANN, DIRECTOR EMERITUS OF THE GERMAN ARCHAEOLOGICAL INSTITUTE IN CAIRO, 2003

A MYSTERY IN STONE

Of all the ancient sites in the world none have so much awed, inspired, and mystified generations than the pyramids and Sphinx of Egypt. These monuments, which stand on the Giza Plateau, have survived for thousands of years and may indeed still be there when our own civilization has long gone. It is as if the image of the pyramids and the Great Sphinx is encrusted in humanity's collective memory, and everyone everywhere, from the very young to the very old, recognizes them at a glance even if they have never been to Egypt. The very words *pyramids* and Sphinx are enough to evoke a deep sense of mystery, of thoughts of life after death and eternity, and of a transcendent connection between earth and sky and between the secular and the spiritual. Yet despite their universal notoriety, no one knows for sure what this mystery in stone is all about. The Giza necropolis is, quite literally, history's greatest paradox. And this paradox is particularly true of the Great Sphinx.

Egyptologists say that the Sphinx is the effigy of a king, and nearly all believe that its face is the face of the Fourth Dynasty pharaoh Khafre, builder of the Second Pyramid at Giza. The combined manlion, they say, is symbolic of the king's intellect and strength. To be fair, some Egyptologists do allow themselves a margin of speculation and see the Sphinx as a symbol of the sun god or the warden of the Giza necropolis, but that is generally as far as they will go. There is no real mystery here, they assert with confidence. We are tempted to say that the jury is still out, but "truth" is not democratic, no matter how many "experts" stick to these conclusions and the consensus. So despite such apparent confidence, the truth is that the questions of who built these magnificent structures and, more importantly, when and why are still largely unresolved.

GATEWAY TO THE STARS AND THE SELECT PLACE OF THE FIRST TIME

First, let us clarify some confusing terminology that is used today by Egyptologists. Giza is not just the site of the pyramids and the Sphinx but also a suburb of greater Cairo, which extends from the west bank of the Nile to the edge of the Sahara Desert. Foreign tourists automatically assume that Giza means the pyramid area, but to the inhabitants of this area the Giza necropolis is known as Al Harram, meaning "the Sacred Place." As for the term *necropolis* itself, it comes from a Greek word meaning "city of the dead," conveying, erroneously, that this place is an ancient cemetery—a concept that would have been seen as reductionist and even alien to the ancient Egyptians who created it. You will often hear Egyptologists calling this place "the Horizon of Khufu," but this, too, is misleading. The ancient Egyptian term was Akhet Khufu, which does not apply to the whole Giza necropolis but *only* to the Great Pyramid. Furthermore, the term *akhet* has a much deeper meaning than simply "horizon" and has more to do with the afterlife form of the king as an "illumined spirit" or, perhaps more accurately, as a "star soul" (Lehner 1997, 29). So what should the Giza necropolis really be called or seen as? In my opinion it should be seen as a sort of "gateway" to the starry world of the Egyptian afterlife.[*1]

The same terminology misconceptions involve the words *pyramid* and Sphinx. These are but crude Greek derivatives or "puns," where *pyramid* comes from *pyramides,* meaning "large cakes," presumably given by Hellenes, who visited Egypt in late antiquity. The ancient Egyptians, however, called these structures *mr,* which, according to the eminent British Egyptologist Sir I. E. S. Edwards, means "the place of ascent" (Edwards 1993, 277–81). As for the term Sphinx, this, too, is a distorted Greek rendition of the Egyptian term *shesepankh,* meaning "living image" (Edwards 1993, 122). The term *shesepankh,* however, was not exclusive to the Great Sphinx but was also used for other effigies of sphinxes in general. The Great Sphinx itself was specifically known as Horemakhet in the New Kingdom (ca. 1500–1150 BCE), and much earlier in the Old Kingdom (ca. 2700–2200 BCE) as Horakhti, both being subtle variations of the epithet "Horus of (or in) the horizon." This is confirmed in the inscriptions found on a large stela that butts on the breast of the Great Sphinx (the so-called Dream Stela) as well as those found on many votive stelae where both names are mentioned; some also name the place as *Setep,* "the Select," and, in the case of the Dream Stela, more specifically as "The Splendid Place of the *zep tepi*" (Jordan 1998, 197), where *zep tepi* translates literally as "first time," a sort of golden age or *primordial epoch* (also known as "first occasion") when the "gods" ruled Egypt. Egyptologists naturally consider zep tepi a mythical idea, a sort of Egyptian "genesis" set in an imaginary pharaonic Garden of Eden. But as we shall see, zep tepi may have been a *real epoch* that was ingrained in the memory of the ancient Egyptians who developed the Giza necropolis.

American Egyptologist Richard Wilkinson was of the opinion that from very early times the Egyptian civilization had "three great themes—original cosmic structure, ongoing cosmic function and cosmic regeneration—[which] may be seen to be recurrent in Egyptian temple symbolism" (Wilkinson 2000, 76), and in a similar vein British Egyptologist Rundle T. Clark argued that all rituals and feasts in ancient Egypt were "a repetition of an event that took place at the beginning of the world [i.e., zep tepi]" and that

> the basic principles of life, nature and society were determined by the gods long ago, before the establishment of kingship. This epoch—*zep tepi*—"the First Time"—stretched from the first stirring of the High God in the Primeval Waters to the settling of Horus upon the throne and the redemption of Osiris. All proper myths relate events or manifestations of this epoch. Anything whose existence or authority had to be justified or explained must be referred to the "First Time." This was true for natural phenomena, rituals, royal insignia, the plans of temples, magical or medical formulae, the hieroglyphic system of writing, the calendar—the whole paraphernalia of the civilization . . . all that was good or efficacious was established on the principles laid down in the "First Time"—which was, therefore, a golden age of absolute perfection—"before rage or clamour or strife or uproar had come about." No death, disease or disaster occurred in this blissful epoch, known variously as "the time of Re," "the time of Osiris," or "the time of Horus." (Clark 1958, 27, 263)

All this would suggest that the most appropriate *name* for the Giza necropolis should be something like "the Select Place of the First Time." However, for convenience and to avoid confusion, we will nonetheless continue to use the terms Giza necropolis, *pyramid*, and Sphinx, not because we sanction them but because they are the terms used in all modern Egyptology literature.

At any rate, let us imagine the Giza region as it might have been before humans came to it. In other words, let us begin our story on a clean slate and set the time line back to that mysterious epoch of zep tepi.

A ROOM WITH A VIEW

In 2005 my wife, Michele, and I rented an apartment on the fourth floor of a modern building that overlooked the Giza necropolis. My intention was to spend a few years in the vicinity of the pyramids and the Sphinx to research and write a book, *The Egypt Code*, commissioned by the publishers Random House.[*2]

Being there on location, I was hoping that it would stir my imagination to "see" what this area might have looked like *before* anything was touched by human hands. I guess I was probably inspired by the words of Paul Devereux, a research fellow with the International Consciousness Research Laboratories group at Princeton University. He wrote, "By coming to see the landscape as it was to ancestors, full of mythic imagery, memory, spirits and powers, one reaches back to deep springs of consciousness. It is an effort that can rekindle a valuable, if now unfamiliar, relationship with the natural environment" (Devereux 2013, 51–63).

To have the Giza necropolis literally next door for three years was an awe-inspiring experience. From my office I had a direct and unobstructed view of the Great Pyramid. And from the rooftop balcony I was treated to a fairy-tale panorama that blended the neo-arabesque style of the Mena House Hotel with the timeless geometrical purity of the pyramids. I could not, however, see the Great Sphinx from this vantage point. For this I would often cycle at dawn to the nearby village of Nazlet el Samman and go on the terrace of the Sphinx Guest House, which is owned by my old friend Gouda Fayed, whose family roots go back several centuries as unofficial guardians of the Giza necropolis. From up there I could eyeball the Great Sphinx when its face would be illumined by the rising sun.[*3]

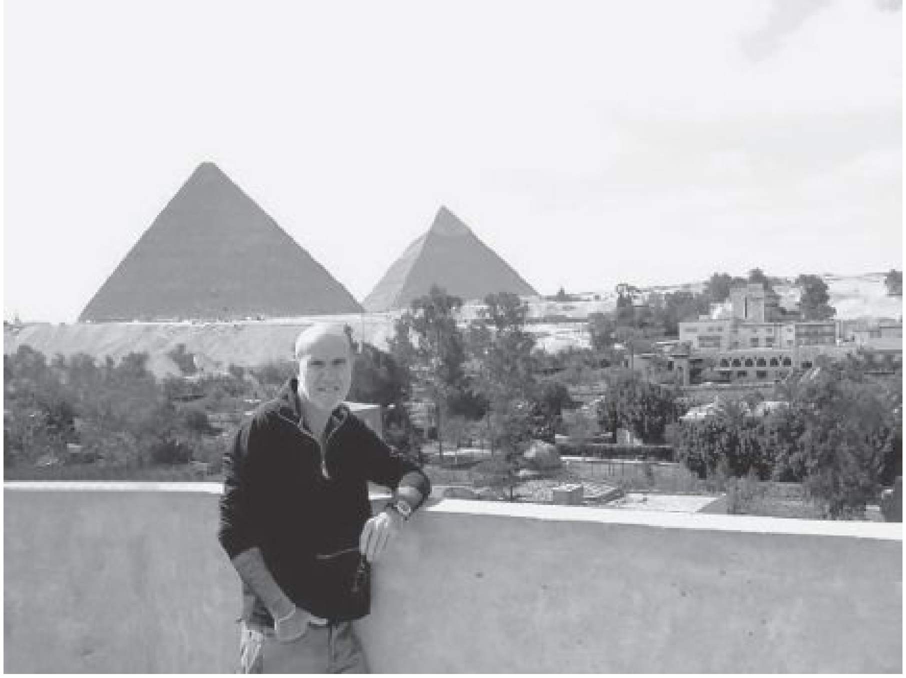


Fig. 1.1. View from the terrace of our apartment's building. The Mena House Hotel is on the right. The Great Pyramid is on the far left, followed by the Second Pyramid.
(Photo courtesy of R. Bauval, 2006.)

Fig. 1.2. Early morning breakfast at Gouda Fayed's Sphinx Guest House. The Great Sphinx is on the left.
(Photo courtesy of R. Bauval, 2006.)

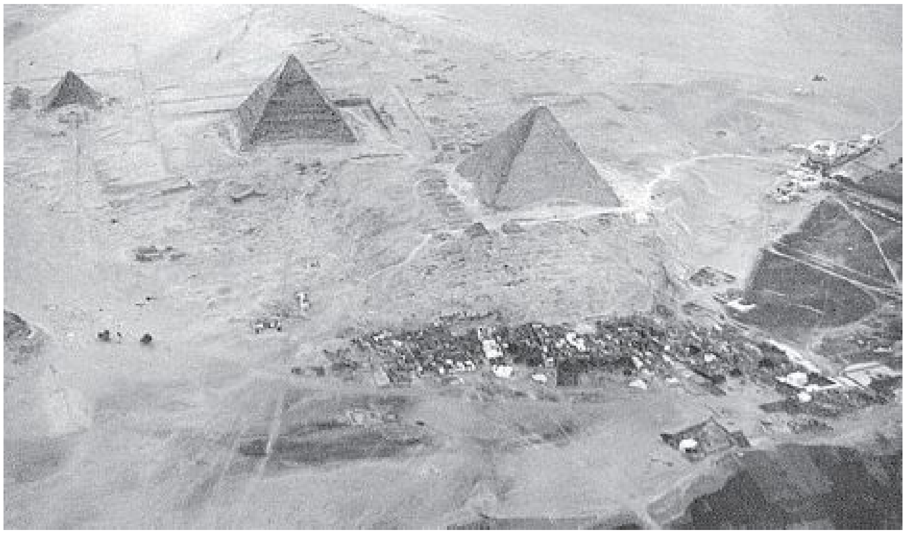


Fig. 1.3. Aerial view of the Giza necropolis circa 1904.

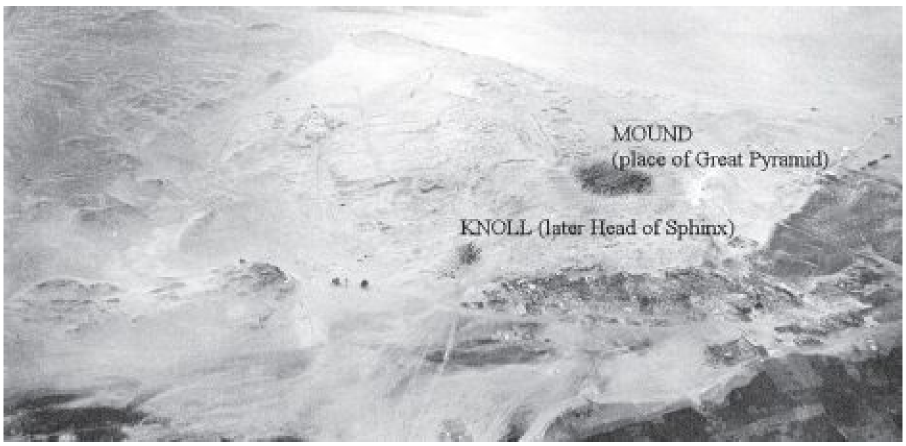


Fig. 1.4. Photoshop of figure 1.3 showing the Giza necropolis as it may have been before the pyramids or the Sphinx were built.
(Photo courtesy of R. Bauval.)

The area around the Giza necropolis is heavily urbanized, with modern buildings, shops, and hotels, but it is not too difficult to imagine how it might have been a century ago or, indeed, even before the pyramids were built.

THE PLATEAU

The Giza necropolis is located on a promontory known to Egyptologists as the Giza Plateau. It is essentially a huge limestone plate (geologically known as the Mokattam Formation) about one kilometer long from north to south and some half kilometer wide from east to west, and it rises sixty-five meters above the Nile River level, sloping gently downward from the northwest toward the southeast to reach the edge of the lush Nile Valley. The *hardness* of the limestone is divided into various distinct layers (see chapter 2). Some of the softer layers are among the lowest and below ground, and some of the harder layers are toward the top with some parts protruding aboveground to form mounds or knolls. There have been several topographical surveys made of the Giza Plateau; the first was by Sir Flinders Petrie in 1881 and the latest in 1984 by American Egyptologist Mark Lehner, who directed the Giza Mapping Project (Lehner 1985, 113). The Giza necropolis unfortunately has been plundered since ancient times and excavated extensively in modern times, making it very hard to define how the original topography might have looked.

Egyptologists have generally focused on the vestiges of the Fourth Dynasty (ca. 2500 BCE) and onward as the time in which they believed the pyramids were built and the Sphinx carved, but there is much evidence that attests to the presence of a much earlier phase. According to Egyptologist Selim Hassan, “We cannot say what made King *Khufu* choose that particular place in which to build his pyramid, but although he was the first to build a pyramid there, the district was already hallowed as a necropolis, and about one mile to the south of *Khufu’s* monument there were already standing some large mastabas, dating from the First and Second Dynasties” (Hassan 1960, 1).

There is evidence that King Djet of the First Dynasty had his tomb on the edge of the Giza Plateau, and there are, too, some artifacts dating from the First and Second Dynasties that have been found in the vicinity (Emery 1963, 73; Petrie, 1907). Also a British geologist, Colin Reader, who undertook an extensive study on the geomorphology of the area, concluded that the Great Sphinx was created before the Fourth Dynasty. Reader, however, stayed safely within the accepted dynastic period by postulating that the First or Second Dynasty was the likely epoch when the Great Sphinx was sculpted (Reader 2001, 149–59). But as we shall argue throughout this book, there is a plethora of evidence to support the conclusion that this monument is far older than dynastic Egypt.

A LION’S HEAD GAZING EAST

We all have experienced the phenomenon of “seeing” faces or images in natural formations such as on boulders, rocky outcrops, or rugged mountain landscapes, or, indeed, in passing cottony clouds. This phenomenon is known as *pareidolia*, which is generally defined as “a psychological phenomenon involving a vague and random stimulus (usually an image or sound) being perceived as significant.” A well-known case of pareidolia, for example, is the so-called face on Mars, which is a natural mound on the red planet in a region labeled Cydonia that many have perceived to be the features of a “Sphinx.” Another notorious case is the so-called monkey in tree in Hong Kah, near Singapore, where crowds came to pray, believing that the monkeylike features in the tree trunk are of divine origins.

Fig. 1.5. The so-called face on Mars.

Fig. 1.6. The so-called monkey in tree.

In desert landscapes this phenomenon is commonly experienced, with windblown rocks and mounds often evoking human or animal features. We can imagine how primitive humans might have been particularly susceptible to this phenomenon and might even have settled near them or built shrines at places that had such shapes in the landscape perceived as sacred. Indeed, in 1992 Egyptologist V. A. Donohue argued that the Theban hills against which the temple of Queen Hatshepsut was built have various simulacra such as the “face” of a pharaoh or that of a cobra that might have been the primary reason for choosing this site for construction of the temple (Donohue 1992, 871–85). Also as early as the 1980s Egyptian geologist and director of the Center for Remote Sensing at Boston University, Farouk el-Baz, proposed that the shapes of the pyramids and the Sphinx of Giza were probably inspired by evocative natural landforms called *yardangs* that abound in the western desert of Egypt. El-Baz also argued that the memory of these landforms was brought into the Nile Valley by prehistoric people forced out of their habitat when the desert became superarid some five thousand years ago due to severe and sudden climate changes (El-Baz 2001). It is, indeed, quite possible that conical- or pyramidal-shaped mounds believed by these primitive people to be the work of supernatural beings or gods may have somehow inspired the idea of pyramids. Having often traveled in the western desert of Egypt, I can vouch that these natural features can easily be mistaken for pyramids by unsuspecting travelers, even at fairly close range! In this respect *it is quite possible that it was a natural knoll protruding out of the sand, a yardang, whose features inspired the head of the Sphinx.*

Fig. 1.7. Artist's impression of the original "yardang" knoll that eventually was fashioned into the head of the Sphinx. (Photo courtesy of R. Bauval.)

Fig. 1.8. Another artist's impression of the "yardang" knoll at Giza that eventually became the head of the Sphinx. (Photo courtesy of R. Bauval.)

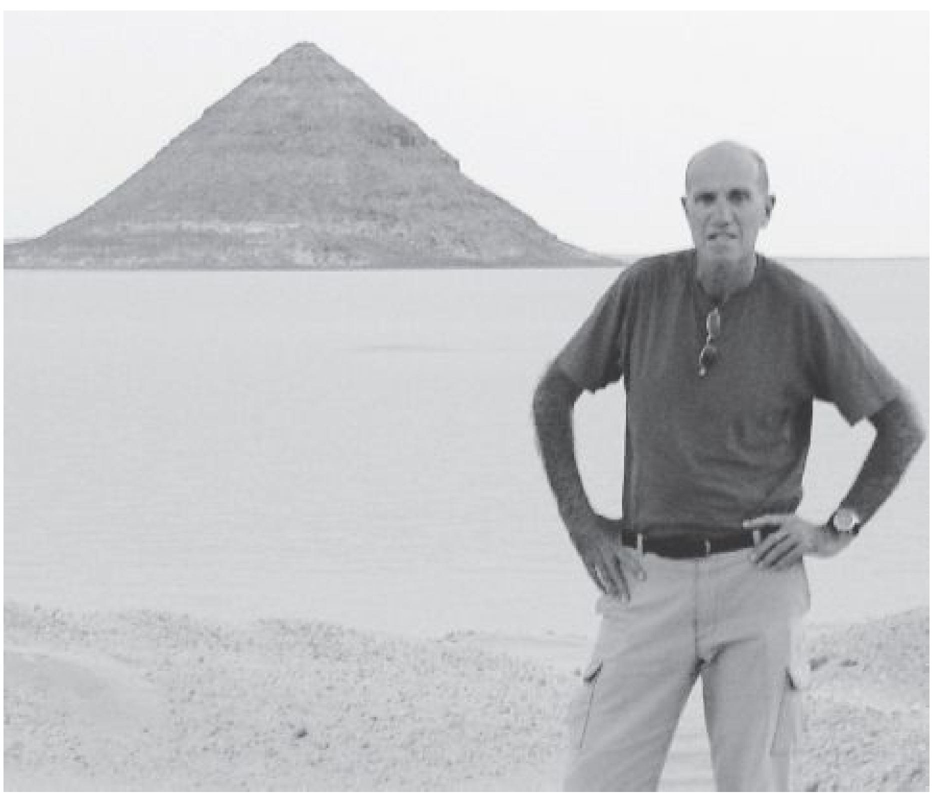


Fig. 1.9. A natural pyramid, or yardang, in the western desert near Abu Simbel. (Photo courtesy of R. Bauval.)

The strong possibility that a rough leonine-head yardang was the origin of the Great Sphinx's head has indeed been proposed by some researchers, including Reader, who wrote that in "the Pre-Dynastic Period—the site may have achieved some local significance, with the principal focus of veneration being the prominent outlier from which the Sphinx was later to be carved. Perhaps resembling the head of a lion or a falcon, this outlier faced east toward the rising sun and as such, may have been linked to sun-worship, justifying its own cult temple" (Reader, 1997/1999). Similarly, in the 1993 NBC television documentary *The Mystery of the Sphinx* (featuring the on-screen presence of Robert Schoch), it was suggested that what was to become the head of the Sphinx was originally a rocky knoll or promontory (see also Schoch 1992, where the suggestion is made that the head of the Sphinx may originally have been a yardang).

FACES IN THE ROCKS

In July 2014 Robert Schoch and I were invited by Bulgarian National Television to participate in a documentary of prehistoric sites in the Rhodope Mountains. There we were shown many natural rock formations that strangely resembled human and animal faces.

Fig. 1.10. The "lion's head" (Rhodope Mountains, Bulgaria). (Photo courtesy of R. Bauval.)

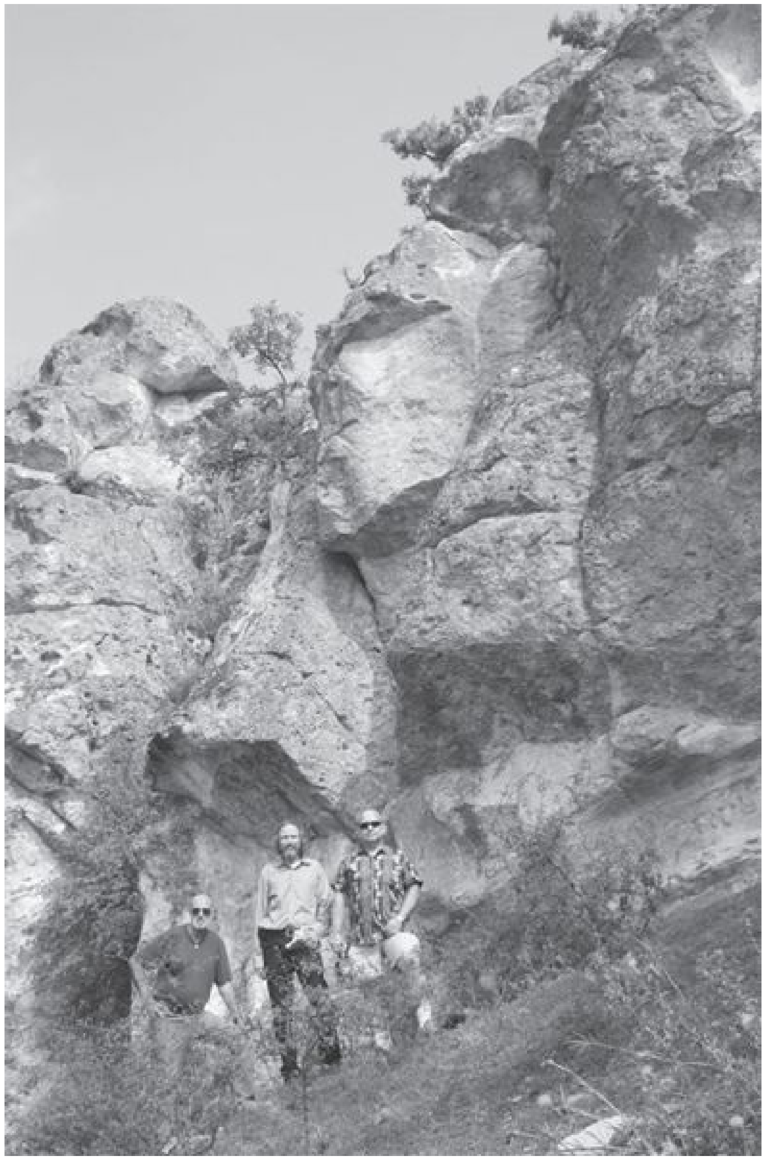


Fig. 1.11. The "lion" or "sphinx" head. In the photo are, from left to right, Robert Bauval, Robert Schoch, and Thomas Brophy (Rhodope Mountains, Bulgaria).
(Photo courtesy of R. Bauval.)

Fig. 1.12. "Man's head" (Rhodope Mountains).
(Photo courtesy of R. Bauval.)

Fig. 1.13. The natural "sphinx" ("Carpathian Sphinx") in the Bucegi Mountains in central Romania.

GIZA: A SACRED LANDSCAPE

In 2004 British Egyptologist Serena Love, Ph.D., a researcher at University College London, presented her "landscape theory" at a conference in Prague. Love argued that the Memphite area, which contains the Giza necropolis, was occupied by people in prehistoric time, perhaps one thousand years before the pyramid builders, and that the latter then placed their monuments near or over natural features that had been sacred to their ancestors. She said:

> The landscape was sacred before it was used for pyramid building . . . the patterns of

> Predynastic and Early Dynastic land use . . . may have influenced later pyramid placement. Over 1,000 years of life and death are represented in Memphis before the first pyramid was built, as there is substantial archaeological material to suggest long-term occupation and sedentary communities. It is suggested here that these early communities of Egyptians had created specific symbolic associations with the landscape, where meaning and cultural significance were gained from repeated use. Memphis was thus “marked” hundreds of years before a pyramid was ever built. (Love 2004, 209)

The natural feature at Giza that was especially considered by Love was the protruding knoll that she conjectured was fashioned during the Fourth Dynasty into the head of a pharaoh wearing the royal *nemes* (headdress). This is what Love had to say:

> A prominent feature on the pre-pyramid landscape at Giza is the east facing “sphinx promontory” [knoll] located on the eastern edge of the Giza plateau. By examining the geology of the sphinx head in relation to the original ground level, it appears that the head of the sphinx would have been a natural feature before the body was carved in later antiquity. The Sphinx’s face has been carved from the old cliff edge and was naturally cut by a wadi to the north and followed the plateau’s southern slope. Although the southern knoll is a larger rock outcrop and a more prominent feature, there may have been something else about the Sphinx promontory that gave it character. It is very probable that this large promontory would have looked rather human-like in its original, unaltered state. Perhaps Predynastic people culturally appropriated the sphinx rock, as a relic left by their ancestors. The human-like appearance of the landform may have been perceived as a ruined sculpture shaped in the past and left by their ancestors. Perhaps the early Egyptians imitated these landforms to honor their past and reinforce a sense of identity, by legitimizing their past. The rock may have even influenced people’s later choice in settling and burying their dead. Giza may have acquired sacred significance in the Predynastic [era] as being a place used and altered by their ancestors. The sphinx rock may have been interpreted as a monumental “relic” left and re-interpreted by people in the Predynastic Period. (Love 2004, 211)

We are in total agreement with Love that the promontory or knoll in question may have had humanlike or, more likely, leonine features that eventually gave rise to the idea of the Great Sphinx. Polish Egyptologist Karol Mysliwiec made reference to the belief noted in ancient Egyptian texts that the first creature to emerge from the Earth at the time of “Creation” was a lion and that this “primeval lion” was then associated with the original sun god of Heliopolis, Atum—a very fitting metaphor for the Great Sphinx emerging, as it were, out of the natural limestone (Mysliwiec 1978). This early belief may also explain the many small statues of lions from the predynastic and early dynastic periods found by Flinders Petrie in 1903–1905 and today displayed at the Petrie Museum in London and at the Ashmolean Museum in Oxford.

We will discuss the head of the Great Sphinx in greater detail when we review the facial features of the Great Sphinx in chapter 4. Meanwhile, we must bring to attention another prominent natural feature of the Giza necropolis that influenced the placing and perhaps even the size and shape of the Great Pyramid. This is a mound higher up the plateau composed of relatively hard limestone that served as the inner core of the lower part of the Great Pyramid.

Fig. 1.14. Several examples of lion statuettes dating from predynastic and early dynastic periods. (Photos courtesy R. Bauval.)

THE SACRED MOUND OF CREATION

From earliest times, perhaps even from deep prehistory, ancient Egyptians had entertained a profound conviction that creation had taken place on a mound at Innu, the On of the Bible and the Heliopolis—literally "city of the sun"—of the Greeks. It was on this Mound of Creation that Egyptians believed had taken place the first sunrise and on which the *bennu,* a magical bird akin to the phoenix, had alighted and, with its primordial cry, had set the world into motion. On the sacred mound of Heliopolis was placed a relic called a *benben,* probably a large iron meteorite that was conical in shape (Bauval 1989; Bauval and Brophy 2013, appendix 1).

The mound of Heliopolis and the great sun temple that was eventually built around it were located on the east side of the Nile Valley, today a modern suburb of greater Cairo called Matareya. Opposite Heliopolis, across the Nile, and some twenty kilometers farther to the west could be seen the "sacred mound" of Giza on which the Great Pyramid would be built. The Giza mound is estimated to have had a diameter of about two hundred meters with a height of about seven to twelve meters. Egyptologists have always assumed that the builders of the Great Pyramid used the mound as natural fill for the lower core of the monument in order to save on material and labor and also to give the pyramid more stability (Isler

2001, 175). But in the mid-1990s I discussed the “Giza mound” with Edwards, pointing out to him that no construction engineer today would risk placing a six-million-ton pyramid on an irregular rocky outcrop because such a massive structure must be safely seated on a perfectly leveled base to ensure the even distribution of the load. As for the supposed saving on labor in using the mound as “fill,” this is a false economy since the alleged time and effort saved would be largely offset by the time and effort required to trim the mound into horizontal tiers to receive the quarried blocks. As an engineer who has faced a similar problem, I would almost certainly have opted for the more practical and much safer choice to simply place the Great Pyramid a hundred meters farther to the west and thus avoid the mound altogether. Since the Giza Plateau had (and still has) a relatively flat and open area in the west, then surely there were no constraining factors that would have prevented this wise choice.[*4] The reason for keeping the mound, therefore, must be sought not in engineering practicalities but rather in a religious or symbolic motive. My own view is that this mound was a sacred ancestral feature that imperatively had to be kept and enshrined into the mass of the Great Pyramid.

MONUMENTAL ARCHITECTURE

Let us now look more closely at the monuments that are still standing on the Giza necropolis. The ceremonial approach to the Giza necropolis was undoubtedly from the east side. The dramatic sight that this affords is of the wide facades of the two temples fronting the Sphinx, with the latter’s head looming behind them. And beyond this imposing arrangement and even more dramatic can be seen the three royal pyramids dwarfing everything around them.

Fig. 1.15. Eastern approach to the Giza Necropolis.
(Photo courtesy of R. Bauval.)

To enter this mysterious afterworld “theme park,” you must go through one of the two doors that are on the eastern facade of the so-called Valley Temple of Khafre. Passing through the temple itself, you will then emerge on the eastern end of a long causeway that leads toward the pyramids. This causeway was probably walled and covered with a roof. Much later, in the New Kingdom and then even later in the so-called Late Period, this temple may have been known as the House of Osiris, Lord of Rosetau—where Rosetau is described as a tunnel through which the deceased could access the afterworld, that is, the pyramid area. There is another temple directly in front of the Sphinx, the so-called Sphinx Temple, which also has two doors on its eastern facade. However, there are no accesses to the actual Sphinx precinct from this temple, so in order to get into this precinct one has to walk along a narrow open-air corridor between the Sphinx Temple and the Valley Temple.

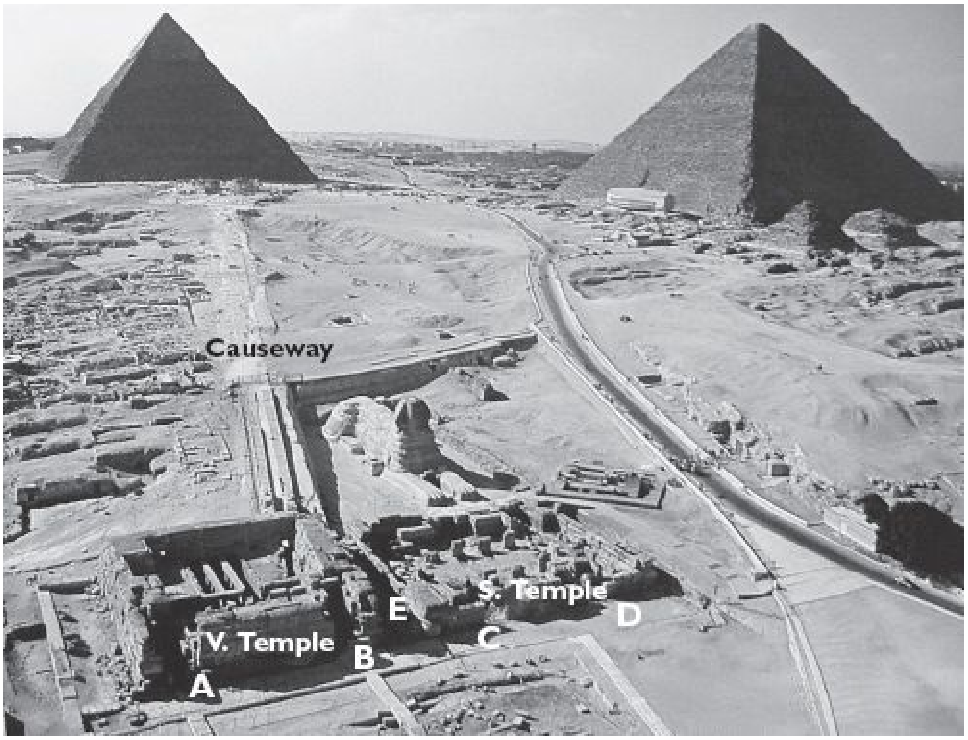


Fig. 1.16. The doors in the eastern facades of the Valley Temple and the Sphinx Temple are marked A, B, C, *and* D. *The open-air corridor leading to the Sphinx is marked E.*
(Photo courtesy of R. Bauval.)

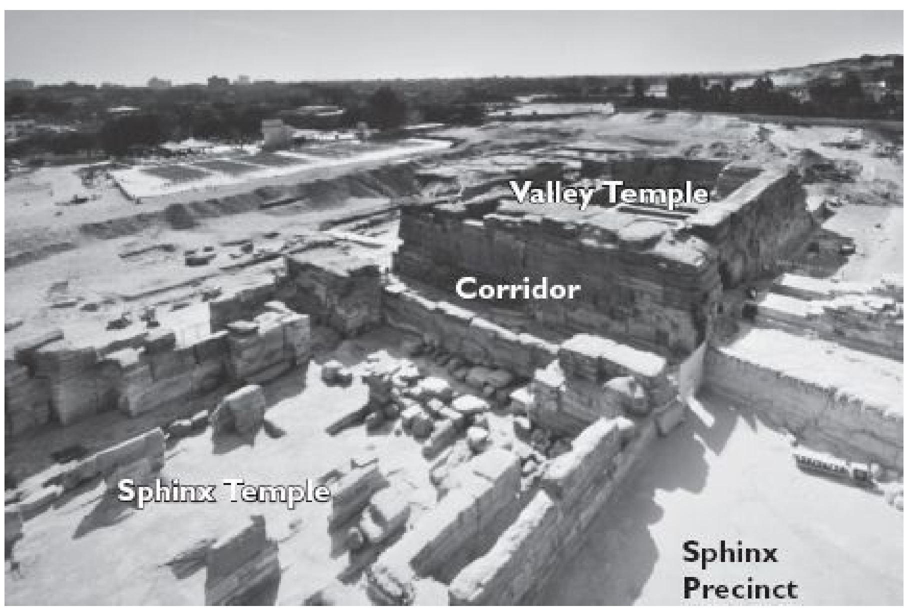


Fig. 1.17. View looking down from the head of the Sphinx.

Edward Brovarski, an Egyptologist at the Boston Museum of Fine Arts, has suggested that the doors of the Valley Temple represent the doors of heaven mentioned in the Pyramid Texts,[*5] which are said to lead the dead person into the afterlife world. Also according to Brovarski, the Valley Temple is to be seen as the "place of purification" in which the corpse of the king was washed and prepared for mummification. Such temples, or “booths of purification,” were known as *ibw*, and Brovarski noted:

> Like the *ibw*, the valley temples had two entrances . . . in the Khafre complex the entrances were doorways at either end of the main façade . . . and could graphically be depicted as the entrance to the next world, as the “doors of heaven.” Essentially, the valley temple was, after all, an elaborate monumental gateway to the pyramid complex and the adjacent cemeteries. A series of spells in the Pyramid Texts mention the “doors of heaven” where Re [the sun god] awaits the king in order to introduce him into the heavenly conclaves. . . . It is through these doors that the king must pass to bathe and be purified. . . . The washing and ritual purification of the king’s corpse was, of course, the chief of the ceremonies performed in the valley temple. The illusion of being in the heavens, when inside the valley temple, was undoubtedly heightened by the golden stars painted on its ceiling against a blue background. Such illusionism was common in Egyptian architecture. (Brovarski 1977, 110)

The Valley Temple and Sphinx Temple are often assumed to be anonymous. This is true only of the Sphinx Temple, which is bereft of any inscriptions. Zahi Hawass, the former Egyptian antiquities minister, has pointed out, however, that “the only remaining inscriptions in the building are around the entrance doorways; they list the king’s names and titles, those of the goddess Bastet (north doorway), and those of Hathor (south doorways)” (Hawass 2016). Hawass was in fact parroting Edwards, who, in 1947, wrote that “around each doorway was carved a band of hieroglyphic inscriptions giving the name and titles of the king. No other inscriptions occur anywhere else in the building.” However, in 1993 Edwards rectified his statement as follows: “Around each doorway was carved a band of hieroglyphic inscriptions giving the name and titles of the king, *but only the last words, ‘beloved of (the goddess) Bastet’ and ‘beloved of (the goddess) Hathor,’ are preserved. No other inscriptions occur anywhere else in the building*” [my italics] (Edwards 1947, 110; Edwards 1993, 124; italics added). In other words, the actual name of Khafre does not appear on this temple as Hawass claimed, *but only his assumed title*. These inscriptions were studied during the Ernst Von Sieglin Expedition of 1909–1912 by the Egyptologist George Steindorff, who confirmed that only the words “Beloved of Bastet, eternal life” are on the north doorway and only the words “Beloved of Hathor” are on the south doorway (Hölscher 1912, 16–17).

A photograph of the inscription of the north doorway taken by author Alan Fildes shows that these inscriptions have much deteriorated and are barely legible today (Fildes 1970). Nonetheless, Hawass insists that “the complex is identified with Khafre from inscriptions on granite casing blocks from the western entrance of the Valley Temple. Reliefs from this complex were discovered at el-Lisht where they were used as fill for the pyramid Amenenhat I (Twelfth Dynasty)” (Bard 1999, 342). Indeed, these inscribed blocks were discovered in 1885 by the French archaeologist Gaston Maspero while excavating at the el-Lisht pyramid. On one large granite block was part of a royal cartouche, which does in fact contain the name of Khafre as well as one of his titles, *nswt biti* (the two ladies), and near it was inscribed the figure of a hawk wearing the royal double-crown, which was assumed to be part of Khafre’s Horus name, Weser-ib (“he who is strong of heart”). Unfortunately there are no extant photographs of this granite block, although a drawing was made by the Metropolitan Museum of Fine Arts during the Egypt Expedition of 1906–1934 (Goedicke 1971, 23).

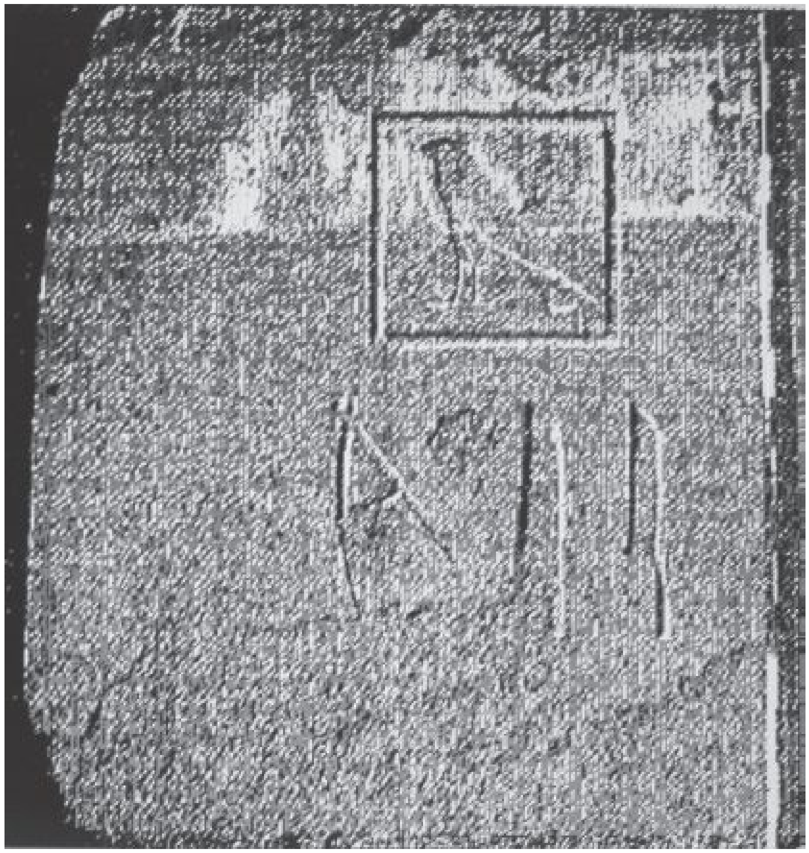
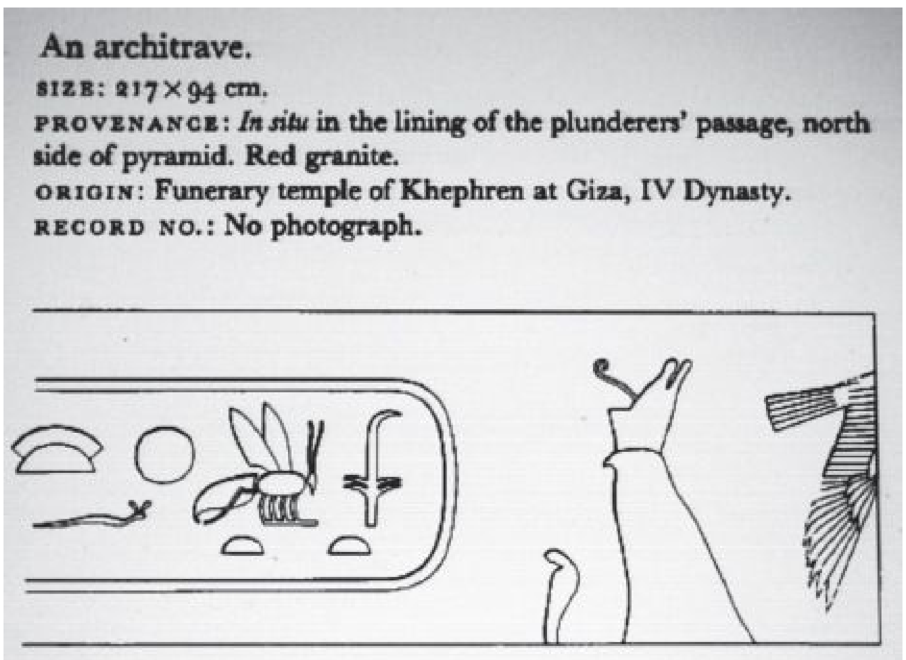


Fig. 1.18. South doorway inscription, "Beloved of Hathor."

Fig. 1.19. North doorway inscription, "Beloved of Bastet, eternal life." (From Uvo Hölscher.)

Fig. 1.20. Photo of north doorway inscription taken in 2013.
(Photo by Alan Fildes.)



An architrave.
SIZE: 217 × 94 cm.
PROVENANCE: *In situ* in the lining of the plunderers' passage, north side of pyramid. Red granite.
ORIGIN: Funerary temple of Khephren at Giza, IV Dynasty.
RECORD NO.: No photograph.

Fig. 1.21. The el-Lisht reused block bearing the name and titles of Khafre. It is assumed to be from the Valley Temple near the Sphinx.

Even if it is correct to assume that Khafre's name was on the granite blocks that clad the Valley Temple, we strongly suspect that the cladding was done to cover a much older temple made from gigantic limestone blocks. But more on that in chapter 7.

THE SKY WORLD OF THE DEAD

The *Duat*

In the Pyramid Texts we are presented with a cosmic/celestial world called the *duat*, which is the afterlife abode of kings. According to French Egyptologist Nathalie Beaux, the duat was imagined as a place in the eastern horizon where the star Sirius and the constellation of Orion were seen rising at dawn (Beaux 1994a, 1–6). Lehner concords with this definition and also adds, “The word for ‘Netherworld’ was *duat*, often written with a star in a circle, a reference to Orion, the stellar expression of Osiris, in the Underworld. Osiris was the Lord of the *duat*, which like the celestial world (and the real Nile Valley) was both a water world and an earthly realm” (Lehner 1997, 29).

Hassan, who undertook a detailed study of the duat mentioned in the many funerary texts, commented:

> If we consider the evidence afforded by the meaning of its name during the Old Kingdom, we shall see that originally the duat, the future Underworld, was localized in the sky, and more particularly in the eastern part of the sky . . . on his arrival in Heaven the dead king is subjected to a ceremonial bathing in order to renew his vitality, just as was partaken by Ra [the sun god] and the setting of stars. But it has apparently another and earthly significance . . . a preliminary purification of the corpse on its arrival at the Necropolis. (Hassan 1934–1935, 277–83)

From the above descriptions by Hassan, as well as those given by Beaux and Lehner, it is clear that the duat was a region in the sky that contained Orion and Sirius. This region of the sky was seen for nearly ten months of the year as it appeared to travel around the Earth from east to west at night, and then was imagined to travel “under the Earth” from west to east in daytime. Starting from the New Kingdom, the Giza necropolis—or perhaps a select place near the Sphinx—was regarded as the domain of Osiris, “Lord of Rosetau,” who was also “lord of the duat.” What is suggested by these epithets is that the Giza necropolis was once seen as an earthly counterpart of the duat, a sort of “heaven on Earth” if you will.

To reach the pyramids from the Valley Temple, one had to walk along the causeway. The Greek historian Herodotus, who visited Egypt in the fifth century BCE, reported that this causeway was a work “of hardly less magnitude than the pyramid itself . . . constructed of polished stone blocks and decorated with carvings of animals” (Herodotus The Histories II, 5th century BCE, 122–23). Remnants of a similar causeway were discovered at Saqqara some fifteen kilometers from Giza; it belonged to the pyramid complex of King Unas of the Fifth Dynasty. Although much smaller than the one at Giza, it nonetheless shows how the causeway at Giza might have looked with decorations and, more interestingly, with a ceiling painted in blue, studded with yellow stars to symbolize the night sky.

Fig. 1.22. The causeway of the pyramid of Unas with part of its roof. (Photo courtesy of R. Bauval.)

Fig. 1.23. A fragment of limestone decorated with stars, from Saqqara. (Photo courtesy of R. Bauval.)

Today only the ruined floors of the three causeways at Giza remain. The one that links the Valley Temple with the Mortuary Temple that is attached to Khafre's pyramid is nearly five hundred meters long and four meters wide.

MEGALITHIC CONSTRUCTION

Modern visitors to the Giza necropolis are mostly impressed with the giant pyramids, but from an engineering viewpoint the Valley and Mortuary Temples are as impressive, indeed if not even *more* impressive. The outer walls of the Valley and Mortuary Temples are built with megalithic limestone blocks weighing an average of fifty tons, with a few weighing some one hundred tons and at least one weighing close to two hundred tons—compared with the much smaller two ton average core blocks from which are built the pyramids![*6]

But what is even more intriguing is that these limestone walls were then clad with smooth-faced granite blocks weighing between three and fifteen tons! Such incomprehensible and seemingly illogical construction is unique in all of Egypt. It should also be obvious to any casual observer that the giant limestone blocks of the temples are far more eroded than those of the pyramids, suggesting that they might be from a much earlier epoch and, furthermore, that the granite cladding was added later, probably by Khafre in the Fourth Dynasty to *cover unsightly erosion.* Also, an oddity of the Mortuary Temple is that it is on the *east side* of the Khafre pyramid, while, paradoxically, the entrance of the pyramid is on the *north side*, suggestive of a different ideology or religious motive.

At any rate, from the west end of the causeway the view around is breathtaking. One would see the Second Pyramid looming in the west, the Great Pyramid towering in the north, and beyond the smaller Third Pyramid the open desert stretching out as far as the eye can see.

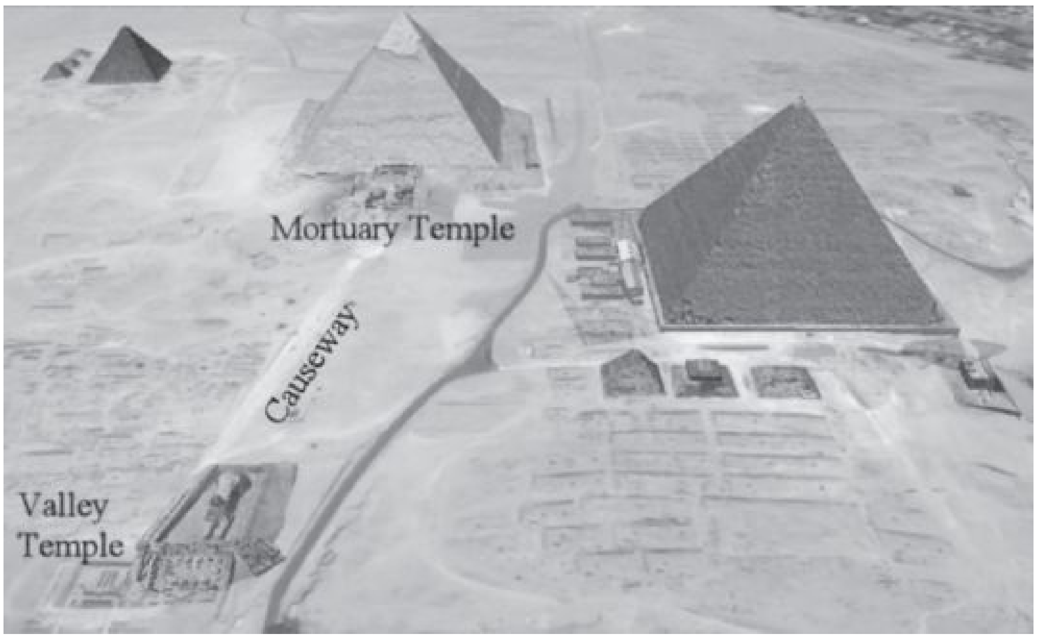


Fig. 1.24. The Giza necropolis, looking west.
(Photo courtesy of R. Bauval.)

I have had chances to climb to the top of the Great Pyramid and was rewarded for my efforts with the most awe-inspiring panorama that this world affords.[*7] The view was once described by my friend Graham Hancock as like being on a magic carpet looking down on a long forgotten fairyland. The best time to experience this enchanted landscape is either at dawn or at sunset. From up there the Great Sphinx appears deceptively small until you suddenly realize that the small, dark specks moving around like tiny ants are, in fact, human beings! Only then one is really hit by the sheer magnitude and strangeness of this place.

On the east side of the Great Pyramid are also three boat pits. They were excavated in the 1940s by Hassan and found to be empty. Two others boat pits on the south side discovered in 1954 by Kamal El Mallakh each contained a large dismantled boat made from cedarwood. One boat has since been reassembled and is today on display in a specially designed structure set over it. The other boat was left undisturbed due to its very poor condition, but recently some sections of it have been moved to the new Grand Egyptian Museum near Giza.[*8]

Fig. 1.25. Robert Bauval and Graham Hancock on top of the Great Pyramid, March 1995.
(Photo courtesy of R. Bauval.)

Fig. 1.26. From the top of the Great Pyramid looking southeast toward the Sphinx. The people look like ants around the giant slouching feline.
(Photo courtesy of R. Bauval.)

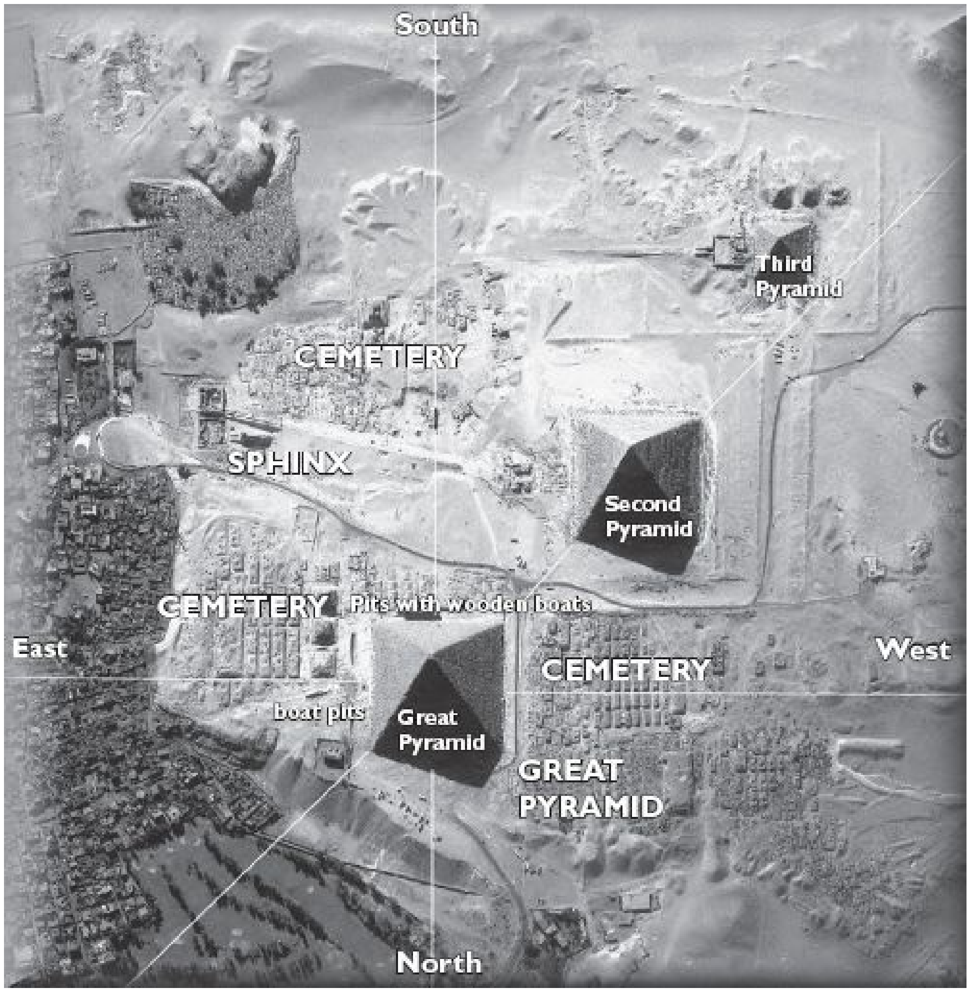


Fig. 1.27. The western, eastern, and southern cemeteries.
(Photo courtesy of R. Bauval.)

Fig. 1.28. The so-called solar boat of Khufu.
(Photo courtesy of R. Bauval.)

Also on the east side of the Great Pyramid are three smaller pyramids (and possibly a fourth now totally destroyed), which are believed to belong to wives or daughters of the king. Similarly, on the south side of the Third Pyramid are three smaller pyramids. The Second Pyramid does not have such small pyramids, but there are traces of a so-called satellite pyramid on the south side.

According to Egyptologists the Giza necropolis was abandoned toward the end of the Old Kingdom, around 2000 BCE, after which it was then plundered, vandalized, looted, and generally left to fall into ruin. It was not until the New Kingdom, thus five centuries later, that it was revived and partially restored, especially the Sphinx and its temples. Also, a sort of pharaonic renaissance took place in the Late Period, when more restorations and embellishments were carried out. Unfortunately, much damage was done by the Arabs after they invaded Egypt in the seventh century, when blocks from the pyramids and temples were used to build palaces, villas, and mosques. This destructive practice went unchecked until the mid-twentieth century, with some local residents helping themselves to good-quality stones from the ancient monuments to use for the construction of their homes. Also, Europeans and American visitors until the mid-nineteenth century freely helped themselves by chipping off pieces of the monuments to take away as souvenirs.[*9]

As we shall see in the next chapter, early explorers and archaeologists did not behave any better, with some of them using gunpowder, dynamite, and high-powered drills in the hope of finding treasures or "secret chambers."

Chapter Two

THE SANDS OF TIME

Robert M. Schoch

. . . aloft on a rocky level adjoining to the valley, stands those three Pyramids (the barbarous monuments of prodigality and vain-glory) so universally celebrated. The name is derived from a flame of fire, in regard of their shape: broad below, and sharpe above, like a pointed Diamond. By such the ancient did express the originall of things . . . uniting all in the supreme head, from whence all excellencies issue.

Not far off from these the colossus doth stand . . . wrought altogether into the forme of an Aethiopian woman: and adored heretofore by the countrey people as a rurall Deity.

GEORGE SANDYS, 1615

Thus wrote the English traveler and adventurer George Sandys (1578–1644) in his book *A Relation of a Journey begun An: Dom: 1610. Foure Bookes. Containing a Description of the Turkish Empire of Ægypt, of the Holy Land, of the Remote Parts of Italy, and Ilands Adjoyning* (first published in 1615), in which he documented his various travels through the Middle East (quoted in Evans 2001/2007).

Certainly there were Westerners who had visited the pyramids and Sphinx prior to the early seventeenth century, for instance during the period of the Crusades and as part of the itinerary of medieval pilgrimages to the Holy Land, but with the popularity of Sandys's book, interest in Egypt accelerated. Travelers were often spurred by more than simply idle curiosity or traveling for the sake of the adventure; many made the arduous journey in search of profound knowledge and wisdom. As Sandys wrote, the Egyptians "first invented Arithmetick, Music, and Geometry: and by reason of the perpetual serenity of the air, found out the course of the Sun and the Stars" (Sandys 1670 edition, 81, as quoted by Barker 1937, 266).

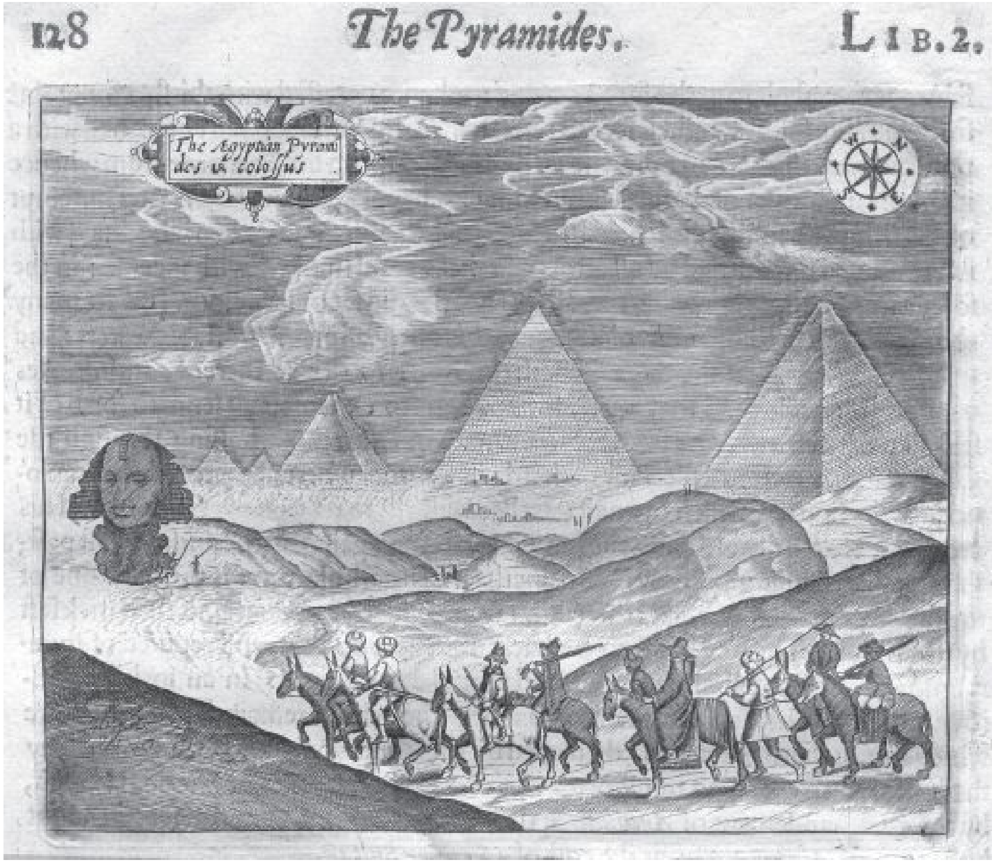


Fig. 2.1. "The Ægyptian Pyramides and Colossus." Early-seventeenth-century rendition of the Giza Plateau, showing the three major pyramids and the Great Sphinx. From George Sandys, 1621, page 128. (Collection of R. Schoch.)

Sandys's fellow countryman, the English astronomer John Greaves (1602–1652), traveled to Egypt in 1638 specifically to make detailed and accurate measurements of the Great Pyramid so as to define and elucidate the basic measures of the ancient and modern (modern from the perspective of Greaves) world; that is, he would clarify and reform the important subject of metrology based on the knowledge encoded in that most magnificent and important of ancient monuments, the Great Pyramid. A personage of no less stature than Sir Isaac Newton (1642–1727) took a strong interest in the work of Greaves regarding the Great Pyramid. Among other things, Newton suspected that the true circumference of Earth (presumably a value known to the ancients) might be encoded in the dimensions of the Great Pyramid. Ultimately, such lines of thinking led to the implicit, and in some cases explicit, belief that somewhere among the ancient ruins of the Giza Plateau, or of ancient Egypt more generally, the keys to the mysteries of the universe might be found (Schoch and McNally 2005). Although not always of primary importance in this quest, the Great Sphinx did not go unnoticed. Greaves, for instance, thought that perhaps there might have been some sort of passage or physical connection between the Sphinx and the Great Pyramid (Evans 2001/2007).

Beginning in the fifteenth century and throughout the sixteenth, seventeenth, and eighteenth centuries, the mysteries of Egypt attracted and compelled intellectuals to attempt to plumb her ancient secrets. Egypt also captured the general European imagination, presenting a totally foreign and exotic perspective on life. The popularity of Egypt was further enhanced due to its biblical connections, for this was the land of Joseph and Moses. Esoteric and occult revelations sprang from this land, not the least of which was the *Hermetica*, a text reputed to contain the wisdom and knowledge of the legendary Hermes Trismegistus, which ultimately reflected the knowledge of Egypt (Schoch 2015). The ancient Greeks identified the Egyptian god Thoth (Theuth, Toth, Jehuti, Djehuti; the deity of wisdom and scribe to the other gods) with their god Hermes and the Roman equivalent, who was Mercury (Mercurius). According to the Roman orator and philosopher Cicero (106–43 BCE), after slaying the giant Argus Panoptes at the behest of

Jupiter/Zeus, Mercury/Hermes went in exile to Egypt, where he imparted to the people the concepts of law and writing—that is, civilization. Hermes gained the epithet Trismegistus (Thrice Greatest; also occasionally written “Ter Maximus”) because he excelled as a priest, a philosopher, and a lawgiver/king. Alternatively, some believed that the “three times great” refers to the three parts of his wisdom: alchemy, astrology, and theurgy, which correspond to the three realms or dominions of the universe: the earthly, the celestial, and the realm of the gods. A copy of the *Hermetica* was discovered in Macedonia and made its way to Florence in 1460, where it was studied and translated by the great Renaissance scholar Marsilio Ficino (1433–1499).

Until their decipherment in the early nineteenth century, the Egyptian hieroglyphs were often viewed not so much as a written language, but as a secret code of mystical symbols used by the ancient priests (Weisbach 1999–2000). The Parisian professor Charles François Dupuis (1742–1809), in his 1795 book *Origine de tous les Cultes, ou la Réligion Universelle* (*Origin of All Cults, or the Universal Religion*; translated into English as *The Origin of All Religious Worship*, Dupuis 1872), traced all religions and myths as well as the foundations of mathematics and science back to the Egyptians’ knowledge of astronomy some fourteen thousand years ago (Buchwald 2003). Thus, when Napoleon brought his savants—scientists from astronomers to zoologists, artists, and mathematicians—to Egypt during his military expedition of 1798–1799, it was not just to document the antiquities as antiquities, but also to delve into and rediscover the deep knowledge that presumably the ancients had possessed but had since been lost. When it came to the Great Sphinx, they measured the colossal head rising up from the sand, and they did some preliminary clearing of the back, but they never undertook major excavations of the beast.

Fig. 2.2. View from the summit of the Great Pyramid, from a stereo view card published by Underwood & Underwood, 1904. (Collection of R. Schoch.)

Fig. 2.3. The Giza Plateau photographed from four thousand feet at sunset by Brigadier General P. R. C. Groves, British Royal Air Force, and published in National Geographic, *September 1926. (Collection of R. Schoch.)*

REVEALING THE SPHINX: THE NINETEENTH CENTURY

The most significant and extensive excavations of the Great Sphinx took place in the first half of the nineteenth century. This was an era before the use of photography in archaeology (indeed, photography was only invented during this period), and there was rarely any systematic recording or preservation of what came out of the ground or was found in or among the ancient structures. Indeed, the early archaeologists and Egyptologists were often not averse to applying brute force in their attempts to penetrate the ancient secrets. (Too often the metaphor of rape is, unfortunately, quite appropriately applied to describe the actions of this early generation of excavators.) Thus, to cite one of the most famous examples, Colonel (later he would be a general) Richard William Howard Vyse (1784–1865), during his *Operations Carried On at the Pyramids of Gizeh in 1837* (the rather militaristic-sounding title of his 1840 report), used gunpowder within the Great Pyramid to blast passages into the so-called Relieving Chambers above the King’s Chamber. (They are also known as the Relief Chambers or Chambers of Construction; Vyse suggested that they were built to somehow alleviate the incredible weight of rock above the King’s Chamber. Of course, the even-lower chambers in the pyramid do not require such relieving chambers; the ultimate function of the chambers above the King’s Chamber remains one of the many mysteries of the Great Pyramid.)

Today this use of gunpowder inside an ancient archaeological wonder may seem a bit harsh and dangerous—the use of excessive force—but to give Vyse the benefit of a doubt, the use of gunpowder was not his first choice. Regarding the Relieving Chambers, the British diplomat Nathaniel Davison had discovered the lowermost in 1765. Vyse’s men had found that they could insert reeds approximately three feet (one meter) long up into cracks in the granite ceiling of Davison’s Chamber and thus suspected that there was another chamber above. Initially, the crew was ordered to chisel through the granite ceiling to the next chamber, but the stone was too hard and there was little room to maneuver, so they resorted to blasting up through the softer limestone of which the walls of the chamber are composed. Ultimately, working their way up, they found four more chambers, stacked one above the other. Including Davison's Chamber, there are five known Relieving Chambers above the King's Chamber. (On a technical note, it is sometimes asserted that Vyse used dynamite, but in fact Alfred Nobel did not invent dynamite until 1866, the year after Vyse had departed this Earth.)

Returning to our subject at hand, the Great Sphinx, not quite so harsh excavation and exploration techniques were applied, most likely in large part because they were not suitable to the shifting sands that had over the millennia buried the statue. Blasting with gunpowder would not only have been inefficient, but also counterproductive.

The first and greatest excavations of the Sphinx in modern times were carried out by a former mercantile sea captain from Genoa, Giovanni Battista Caviglia (1770–1845), who arrived in Egypt in December 1816 and, fascinated by the Sphinx and pyramids, worked on and off at Giza for the next twenty-odd years, beginning with an excavation of the Great Sphinx in 1817 (Usick and Manley 2007). (As we shall discuss later in this chapter (see p. 86, section titled "We Were Not the First: Ancient Excavations and Restorations"), the very ancient Great Sphinx was excavated and restored in ancient times, for instance during the New Kingdom, more than three thousand years ago, and during Greco-Roman times, two millennia ago.) For a time, Caviglia actually took up residence in the Great Pyramid, using Davison's Chamber as his "apartment." (This was prior to Vyse's arrival in Egypt in the 1830s.) One of Caviglia's primary patrons was Henry Salt (1780–1827), who served as the British consul general in Egypt from 1816 until his death in 1827. Salt was a trained artist, and he prepared a *Memoir on [the] Pyramids and Sphinx* (also referred to as *Sphingographia or Drawings descriptive of the result of Excavation made at the great Sphinx of Ghizeh* . . ., a title suggested by Col. W. M. Leake, who edited the manuscript a few years after it was written), which was illustrated by Salt's own drawings and documented Caviglia's early (1817) excavations of the Great Sphinx. Although it was never published in toto as had been planned, probably due to the high costs of such a publication, portions did appear in print in various books and periodicals during the period of 1817 through 1842, including in the appendix volume to Vyse's *Operations* (mentioned previously). The majority of the manuscript and accompanying illustrations currently reside in the archives of the British Museum, and portions were published in 2007 (Usick and Manley 2007).

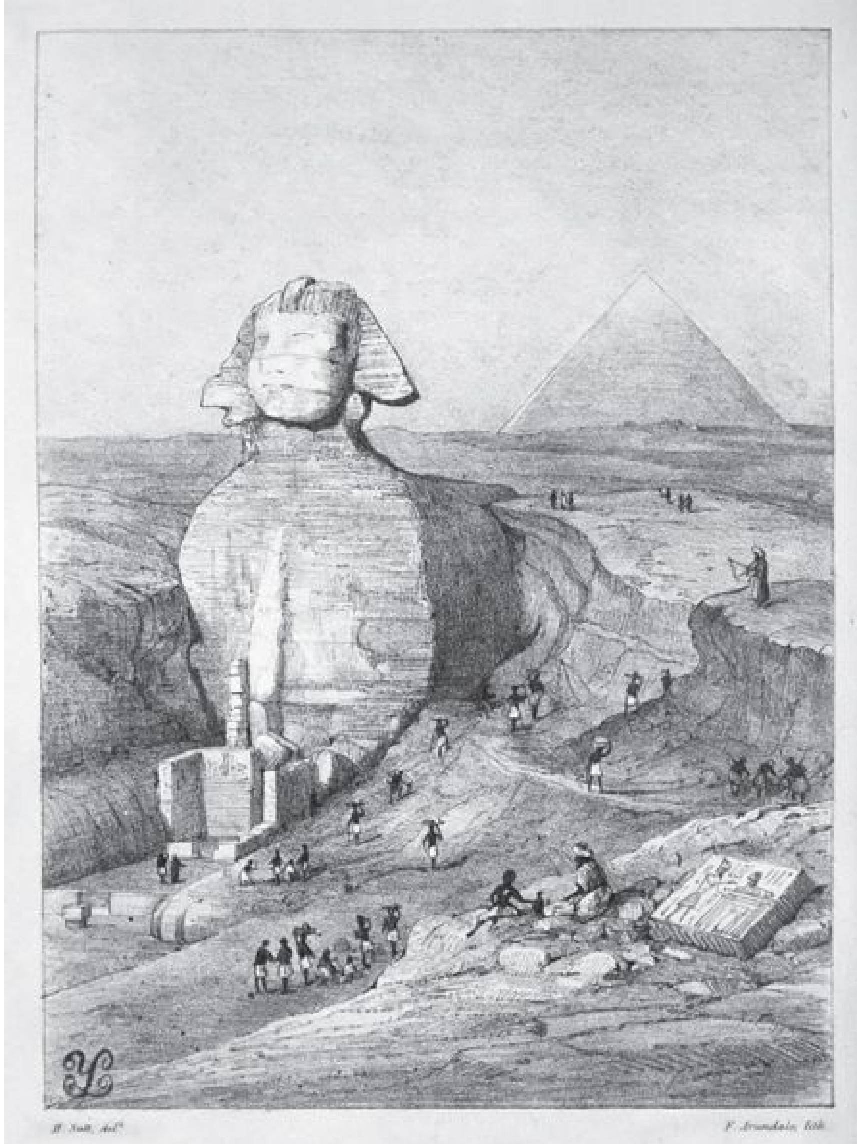


Fig. 2.4. Caviglia's excavation of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 106 and 107.*

The Great Sphinx and the Giza pyramids have attracted more than their fair share of odd thinkers over the centuries, and Caviglia was no exception. He was immersed in occultism, mysticism, and his own brand of religious fundamentalism and Old Testament literalism. Like many before and after him (see, for instance, the discussion in Schoch and McNally 2005, pp. 62–63 and 143–59), Caviglia was certain that encoded in the antiquities of Egypt, and Giza in particular, lay many esoteric, religious, and scientific secrets—if only they could be interpreted correctly. His excavations and studies were not undertaken lightly as simply a hobby or a means to supply European museums with prize works of ancient art, but with the idea that the key to deep and profound knowledge would be discovered. (Some of the artifacts Caviglia uncovered ended up in the British Museum, London; others are now in the Louvre, Paris; some remain in Egypt; and other artifacts have apparently vanished; Hassan 1949, 13.)

Caviglia was the first person since ancient times to oversee a major clearance of the accumulated sand around the Great Sphinx. The French savants under Napoleon Bonaparte during his invasion of Egypt, 1798–1799, had been aware that there was the body of a beast under the sand, as they cleared and studied the contours of the back, but they had not carried out full-scale excavations. However, the French had carried out some limited excavations, according to Salt. He states in his memoir:

> From various reports in circulation in Egypt, I was given to understand that the French Engineers, during their stay here, had made a considerable excavation in front of the Sphinx, and that they had just discovered a door, at the time they were compelled by untoward circumstances to suspend their operation.
>
> This account was confirmed by the repeated assertions of the Arabs, several of whom declared they had been present at the discovery and said it led into the body of the Sphinx, while other[s] affirmed that it conducted up to the second Pyramid.
>
> Though little stress could be laid upon such asseverations, yet they rendered Captain Caviglia very unwilling to give up his researches, without doing all in his power at least to ascertain the facts. (quoted from Usick and Manley 2007, 65; material in brackets inserted by R. Schoch)

The truth concerning the extent of any French excavations is unclear. Regarding a supposed door, it is possible that they did carry out excavations and came upon at least the upper portion of the granite Dream Stela (Dream Stele) of Tuthmoses IV (ca. 1400 BCE) that sits to this day between the paws of the Sphinx, and perhaps this was mistaken for a door. However, it is not a door and leads neither into or under the Sphinx, nor to a passageway up to the Second Pyramid. This portion of the tale must have been a fabrication on the part of the Arabs, and it is not inconceivable that the entire story of the French excavating and finding a "door" was a yarn spun by the Arabs for the competing Europeans who might hire the Arabs to carry out excavations. In the case of Caviglia, this strategy may have worked as he indeed wanted to determine if there was any truth to the stories of a door. And, with a mindset such as Caviglia held, a door may indeed lead to unknown chambers and passageways that could contain the secret knowledge he was determined to bring to light.

Caviglia began in early 1817 by excavating at the left (northern) shoulder of the Sphinx. His workmen were digging through loose sand, and, according to Salt, more than half the sand removed each day would be blown back by the wind at night. Furthermore, despite using a framework of planks to hold back the sand, the situation was incredibly perilous; one false move or accident could have resulted in someone being smothered to death in an avalanche of sand. Ultimately, this first attempt at excavation had to be abandoned, but not before Caviglia's laborers had reached the base of the Sphinx by creating a trench that measured twenty feet across the top but narrowed to a mere three feet at the bottom. Along the side of the trench a section of the body of the Sphinx was revealed, where they could make preliminary observations.

Salt states, "The external surface of the body in this part was found to be composed of irregularly sized stones, built up with much care, and covered with red paint, with no very clear indications of the form, but having three protruding ledges, one below the other, sufficiently broad for a man to walk upon, that formed in all probability the lines of the mantle, or dress. . ." (Salt, in Usick and Manley 2007, 65).

These irregularly sized stones and the ledges that were observed probably relate to the very ancient weathering and erosion to the body of the Sphinx that was subsequently repaired in more recent ancient times (dynastic through Greco-Roman; see chapter 7). There is evidence that at various times the Great Sphinx, either in its entirety or selected portions, was painted. Alternatively, some of the supposed "red paint" may also be natural mineral streaks, although in this case I suspect that Caviglia had found actual traces of red paint on various ancient repairs to the Sphinx.

During the months of March through June of 1817, Caviglia employed sixty to one hundred laborers each day to undertake large-scale excavations of the paws and body of the Sphinx. These excavations resulted in a number of important discoveries. The first was fragments of a giant plaited beard that had once belonged to the Sphinx. As described and illustrated by Salt, some of the stone fragments included plaited beard hair on one side, and on a side at right angles to the plaited hair occurred various carved hieroglyphics and kneeling human figures. Other fragments of the beard and supporting masonry were found, such that Salt sketched a reconstruction of the Sphinx with a beard supported by a column, pillar, or wall of stone blocks rising up from between the front legs. Yes, the Sphinx once had a beard (see discussion here), but whether it originally had a beard and when the beard fragments found by Caviglia were put in place (could they be New Kingdom additions?) remain open questions. We must remember that the Sphinx has been heavily modified, reworked, and restored numerous times in its long history.

In addition to the beard fragments, Caviglia's crew uncovered pieces of the uraeus, specifically the cobra's head, of the Sphinx's headdress (Usick and Manley 2007, 1; Zivie-Coche 2002, 18).

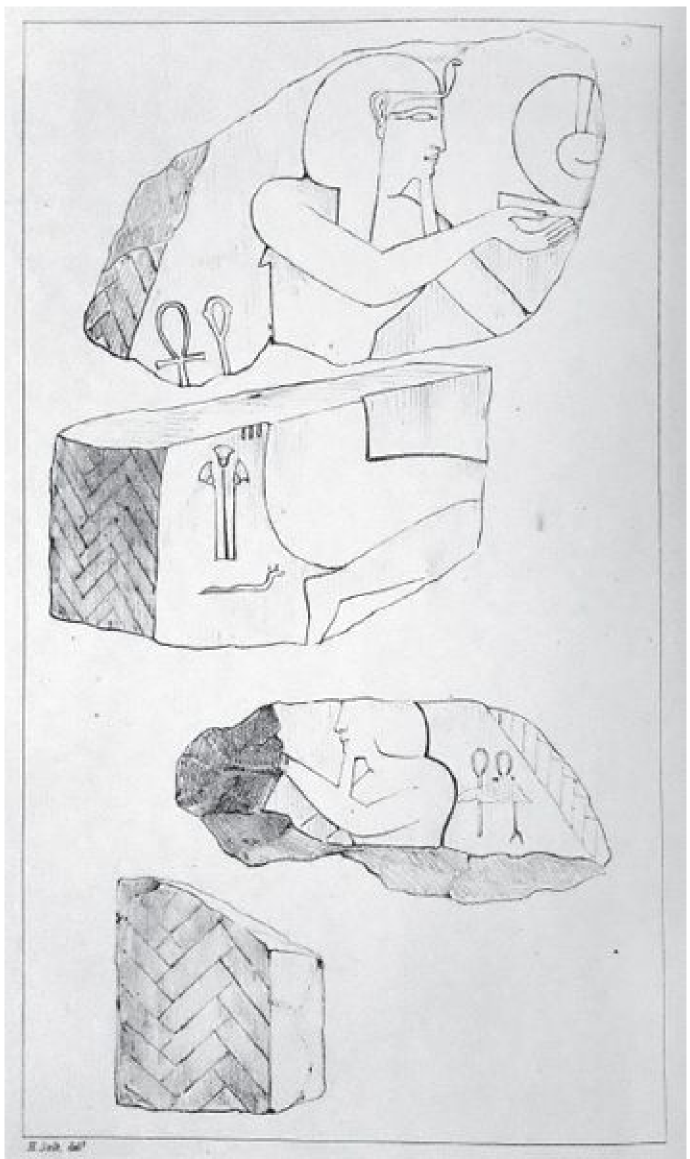


Fig. 2.5. Fragments of the beard of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 108 and 109.*

Fig. 2.6. Fragments of the beard of the Great Sphinx, along with a possible piece of the uraeus (the cobra's head; upper left corner) of the Great Sphinx, currently on display in the Egyptian Museum, Cairo. (Photos courtesy of R. Schoch and C. Ulissey.)

Immediately below the chin of the Sphinx, Salt states that a "chamber" was uncovered measuring about ten feet long (presumably this is the east-west direction of the body of the Sphinx) by five feet in which more small fragments of the beard were found. Next, the granite stela now known as the Dream Stela of Tuthmoses IV was located. (At this time the hieroglyphs could still not be read; it was not until 1822 that Jean François Champollion [1790–1832], using the Rosetta Stone, first offered the breakthrough leading to full decipherment.) The Dream Stela rests between the paws of the Sphinx, and Caviglia discovered two more stelae carved of limestone, angled perpendicular and to either side of it (now known to have been erected by Ramesses II in the thirteenth century BCE; Zivie-Coche 2002, 18), which apparently formed the sides of an open-air chapel between the paws of the Sphinx; one would enter the chapel from the east by walking toward the west between the paws to an area formed by the limestone stelae, where you would find yourself facing the magnificent Dream Stela. At the time of Caviglia's excavation one limestone stela remained in place, and the other had fallen onto its front surface. According to Salt the latter stela was sent to the British Museum; currently both of the limestone stelae reside in the Louvre Museum, Paris (Usick and Manley 2007, 69, note 89).

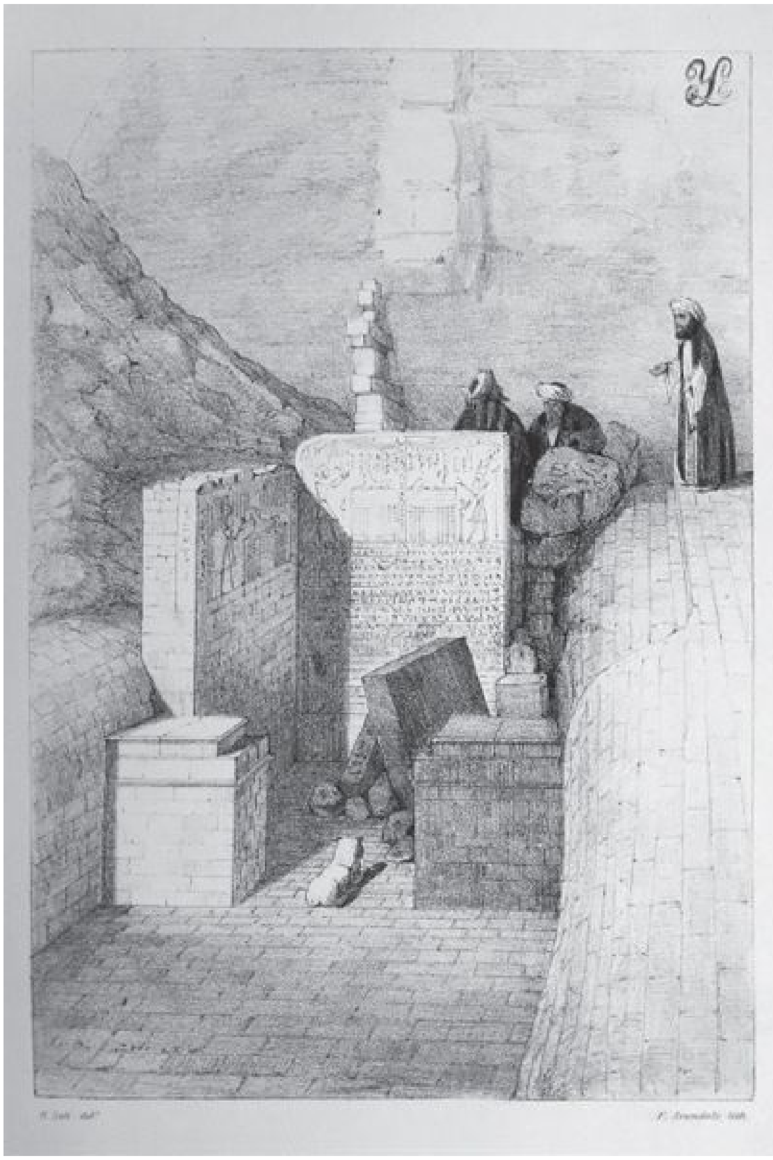


Fig. 2.7. The stelae and temple between the forelegs of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 110 and 111.*

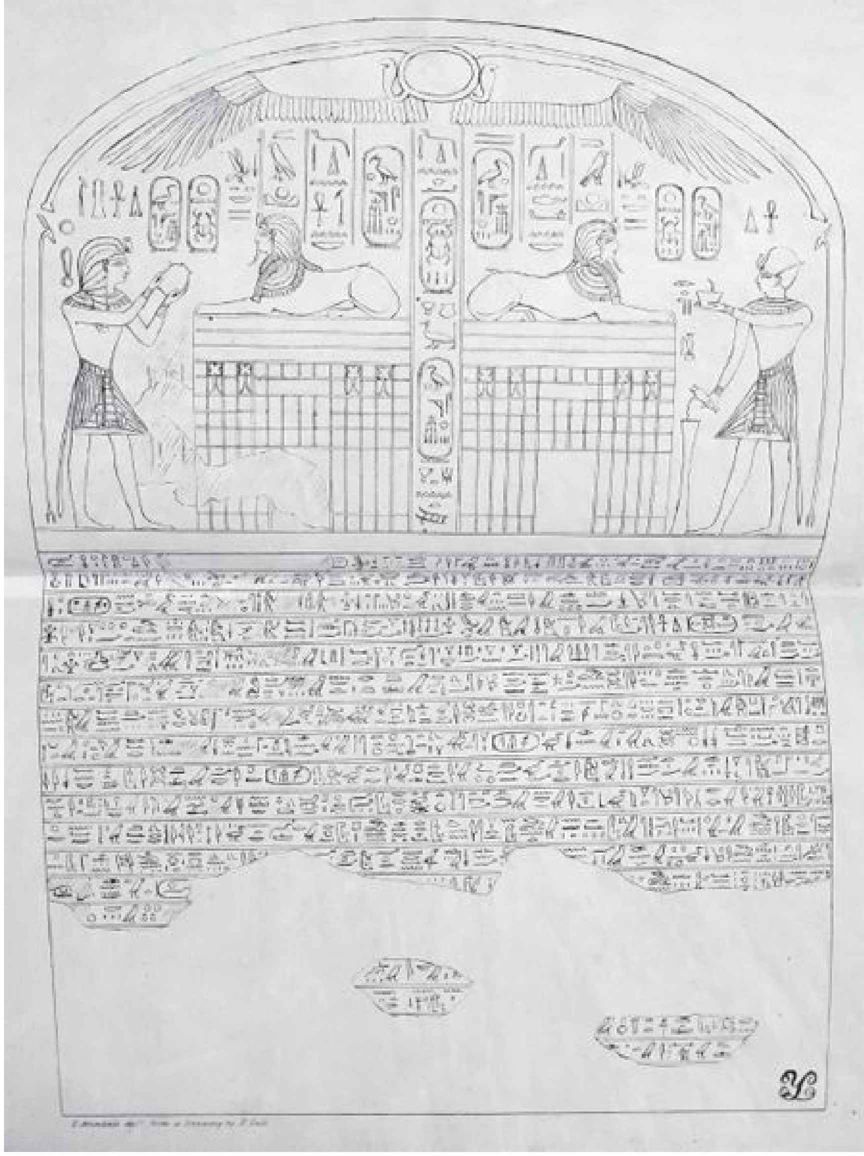


Fig. 2.8. The Dream Stela between the forelegs of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 114 and 115.*

Within the temple a small carved recumbent lion, placed facing the breast of the Sphinx, was found along with fragments of other carved lions and the forepart of a small sphinx. These objects, as well as the walls and platform of the temple, were recorded by Salt as "ornamented with red paint, a colour, it would seem appropriated here, as in India, to sacred purposes" (quoted in Usick and Manley 2007, 66). Excavating farther to the east between the paws, Caviglia located an outer (eastern) wall and entrance to the chapel area; this eastern wall ran between the paws of the Sphinx at the approximate location of the first digits (thumbs in a human), and just beyond this wall (to the east) was found a granite altar (which to this day remains in place). The altar had ornaments, or "horns," in its corners, one of which was found. Salt observed evidence of fire on the altar and speculated that it was used for burnt offerings. Also found in the area was another carved lion (this one also recumbent, with the head turned to the left), an owl figure, and what appear (based on Salt's drawings) to be several small (portable?) stone altars.

Inscribed on the paws of the Sphinx, carved into the limestone blocks used to repair the Sphinx in ancient times, were numerous inscriptions in Greek. One such inscription named an "Arrian" who, some of Salt's colleagues speculated, could be the Roman commander, historian, and philosopher of that name (died ca. 175 CE). Some of the inscriptions that were found mentioned the Roman emperors Antoninus Pius (ruled 138–161 CE) and Lucius Verus (co-emperor with Marcus Aurelius, 161–169 CE).

One of the Greek inscriptions also mentioned Osiris, regarding which Salt commented, “And this confirms what one of the old authors has hinted at that the Sphinx was considered as the guardian of the tomb of Osiris. May we suppose then that the tomb of the God be still somewhere in the body of the statue? Or was the pyramid behind it his tomb? At all events it gives the inscription a double value” (quoted in Usick and Manley 2007, 69, note 105).

Fig. 2.9. Robert Schoch with the Dream Stela. (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 2.10. Inscription on one of the paws of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 118 and 119.*

Despite continuing difficulties, Caviglia persisted in the excavations. Given the nature of the loose sand, as described by Salt, "in spite of all precautions, the slightest breath of wind, or concussion *of any kind* set all the surrounding particles of sand in motion, so that the impending sides began to crumble in, and mass after mass came tumbling down, till the whole surface took no unapt resemblance to a cascade" (quoted in Usick and Manley 2007, 66; italics in the original). To the east of the front paws of the Sphinx was found a flight of thirty stairs that ascended toward the east. The stairs were bound on each side (north and south) by unbaked brick walls lined with stone blocks and coated with plaster. At the top of these steps was a level landing area with a stone platform or stand, perhaps a reviewing stand or sort of podium or rostrum, which Salt speculated was used by the Roman emperors or other "great personages" (Usick and Manley 2007, 66) to observe ceremonies that took place at the Great Sphinx.

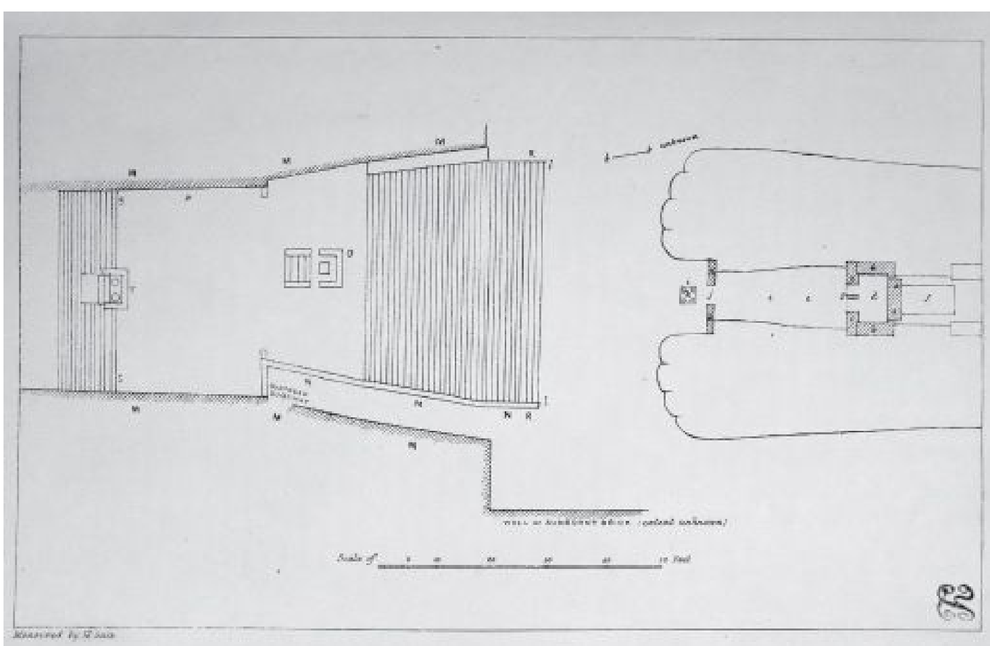


Fig. 2.11. Ground plan of steps in front of the Great Sphinx, based on a drawing by Henry Salt, in Appendix to

Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 110 and 111.*

Further excavations to the east revealed another flight of thirteen stairs ascending to the east, above the previously mentioned level area, to another level area with another viewing platform or edifice, this one with two columns. Beyond this to the east a broad pathway continued, leading east toward the Nile. On and among the stairs, platforms, and edifices various inscriptions dating to the first through third centuries CE were found. All in all, this pathway and the stairs must have created a dramatic effect as one walked them following a westward course toward the Great Sphinx; Salt suggested that it would have been particularly dramatic in the evening with the sun setting behind the Great Sphinx. Unfortunately, these monumental Roman-period stairways, esplanades, and viewing platforms, which Caviglia excavated in 1817, were removed and destroyed during the excavations and “repairs” undertaken at the Great Sphinx by Émile Baraize between 1925 and 1936 under the authority of the Egyptian Antiquities Service (Usick and Manley 2007, 6). However, in demolishing them, the Sphinx Temple, which lay underneath, was revealed.

Fig. 2.12. View of the steps leading to the Great Sphinx as seen when standing at the Sphinx, based on a drawing by Henry Salt, in Appendix to Operations Carried On at the Pyramids of Gizeh in 1837 *by Richard William Howard Vyse, 1842, insert between pages 112 and 113.*

Following Caviglia’s excavations, without continued maintenance or any kind of walls or screens built to hold back the ever-encroaching sand, the Great Sphinx became substantially engulfed once again. The Prussian Egyptologist Carl (Karl) Richard Lepsius (1810–1884) cleared out and uncovered the chapel and Dream Stela during his 1842–1843 expedition to Egypt. In 1853 and 1858 the Egyptologist Auguste Mariette (1821–1881), who founded the Egyptian Department of Antiquities (Antiquities Service), again oversaw campaigns to clear out the Great Sphinx. He also discovered the so-called Valley Temple, located just south of the so-called Sphinx Temple (not yet uncovered) at the foot of the causeway leading to the Second Pyramid. In addition, Mariette’s crews found the remains of ancient unbaked mud-brick walls that had served as barriers to the sand that constantly threatened to bury and reclaim the Sphinx once again (Zivie-Coche 2002). Interestingly, according to Egyptian archaeologist Selim Hassan (1949, 14), Mariette proposed the theory “that the Sphinx was a natural phenomenon of

Nature and that all the sculptor had done, was to slightly touch up the features, which he admits was skilfully [*sic*] done!" Thus, it seems that Mariette may have recognized the extremely ancient weathering and erosion on the Great Sphinx, weathering and erosion that predates dynastic times—a subject we will return to in chapter 7.

Fig. 2.13. The Great Sphinx with the Third Pyramid in the background, circa 1870s or 1880s (?), from a glass lantern slide. (Collection of R. Schoch.)

Fig. 2.14. The Great Sphinx with the Second Pyramid in the background and a camel and rider in the foreground, circa late nineteenth century, from a glass lantern slide. (Collection of R. Schoch.)

Fig. 2.15. The Great Pyramid, Second Pyramid, Great Sphinx, and the Valley Temple, circa 1870s or 1880s, published by Maison Bonfils (the studio/company of Félix Bonfils). (Collection of R. Schoch.)

Fig. 2.16. The Great Pyramid, Great Sphinx, and Valley Temple, circa 1880s (?), from a glass lantern slide. (Collection of R. Schoch.)

In honor of the opening of the Suez Canal in 1869, the Sphinx was again cleared out (Anonymous 1887).

Gaston Maspero (1846–1916), Mariette's successor as director of the Antiquities Service, had the Sphinx area cleared out once again in 1885–1886, and the work was continued by his successor, Eugène Grébaut, in 1887–1888. In order to accomplish the Herculean task, Maspero purchased wagons that ran on rails to move the sand and debris away from the site. The Great Sphinx and its mysteries personally fascinated Maspero, and he believed there might be a tomb or subterranean chamber under the Sphinx (see here for a discussion of the chamber that was located seismically more than a century later), and Maspero also expressed the opinion that the Great Sphinx is the "most ancient monument in Egypt"

(Hassan 1949, 17), dating back to a time before the pyramids. Stories circulated that Maspero was searching for buried treasure around or under the Sphinx, and in particular he wished to find the "Cup of Solomon." This was supposed to be a large onyx cup that had belonged to the Israelite King Solomon, son of David, and that had magical properties of divination. When a liquid was poured into it, the liquid would spin around, indicating success and prosperity or failure and calamity, depending on the direction of spin. Such stories, as they circulated, could only heighten interest in the "mysteries of Egypt" and feed into a practical aspect of the labors involved in clearing the Sphinx—that being tourism (Zivie-Coche 2002). Egypt was fast becoming a major tourist destination, and Maspero wanted to add to the attractions on the Giza Plateau by presenting a cleared Great Sphinx. As photos of the time demonstrated, visitors loved getting up close to or even climbing on the Great Sphinx.

Fig. 2.17. Photograph of the Great Sphinx, circa 1880s (?). G. Sarolides published this photograph; Maison Bonfils (the studio/company of Félix Bonfils) published the identical photograph. It is not clear who should be credited with taking the original photograph (possibly Sarolides copied the Bonfils photograph). (Collection of R. Schoch.)

Fig. 2.18. The Great Pyramid, Great Sphinx, and Valley Temple, circa 1870s or 1880s (?). Photograph from a stereo view card, photographed and published by Frank M. Good, London. (Collection of R. Schoch.)

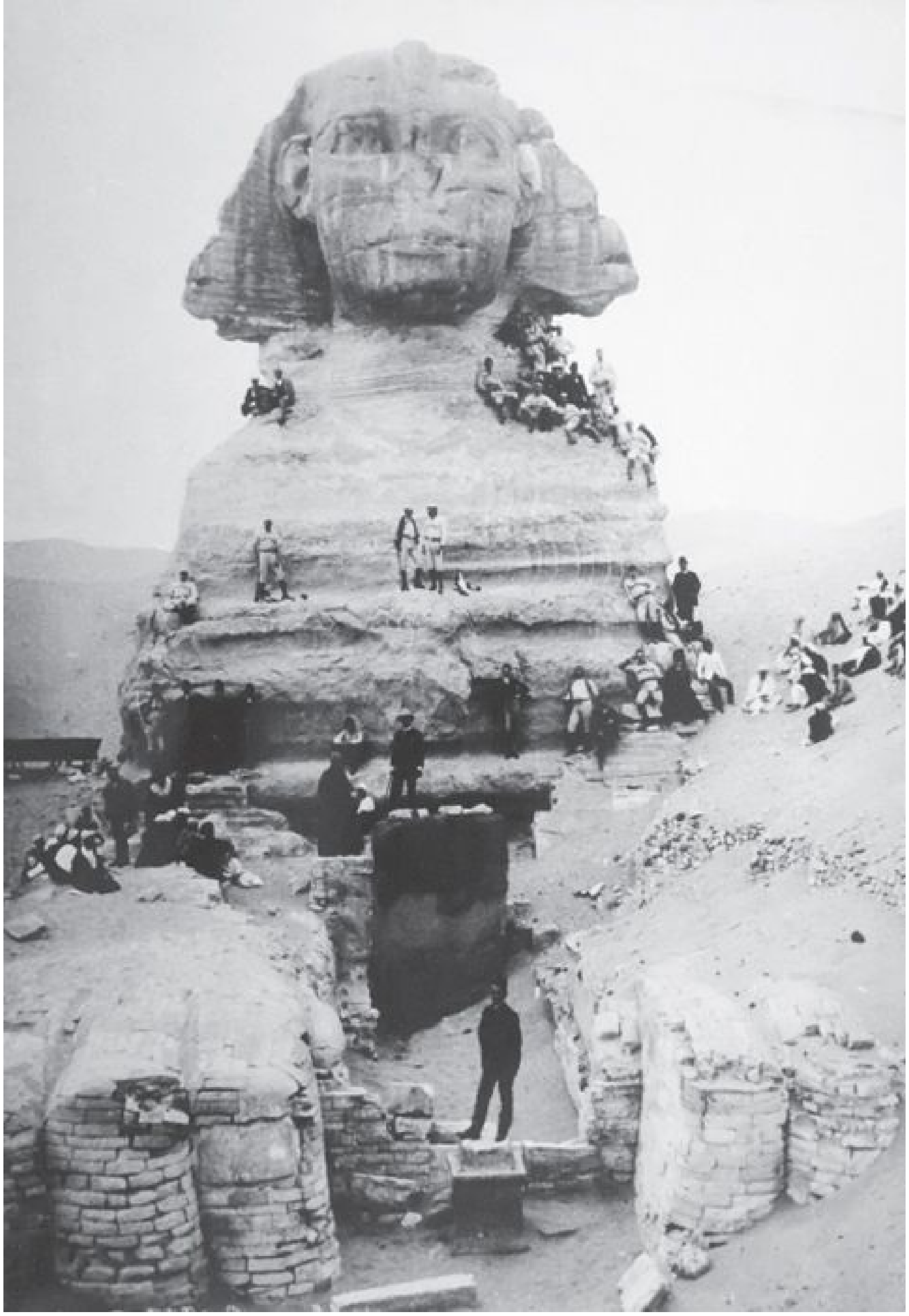


Fig. 2.19. The Great Sphinx, February 9, 1889. Modern print from an old negative. (Collection of R. Schoch.)

Fig. 2.20. Photograph of a photographer taking a picture of the Great Sphinx, circa late nineteenth century. From a stereo view card, published by Roberts & Fellows, Philadelphia, Pennsylvania. (Collection of R. Schoch.)

Fig. 2.21. Southern flank of the Great Sphinx with the Great Pyramid in the background and a portion of the Valley Temple in the foreground. Late-nineteenth- or early-twentieth-century postcard. (Collection of R. Schoch.)

EXCAVATIONS AND REVELATIONS OF THE TWENTIETH CENTURY

The next significant excavations, and the last major excavations, of the Great Sphinx were carried out first by Émile Baraize with Pierre Lacau, 1925–1936, under the authority and auspices of the Antiquities Service, and next by Selim Hassan, 1936–1938, of Cairo University. As already noted, under the direction of Baraize the Roman pathway, steps, and landings were demolished in order to partially excavate the Sphinx Temple (Zivie-Coche 2002, 38) located due east of the Great Sphinx and just north of the Valley Temple. During his excavation and destruction of the Roman structures, a number of New Kingdom through Greco-Roman artifacts were found. Baraize had huge walls built to hold back the sand that continually threatened the Sphinx, and he also addressed the badly weathered and eroded condition of the statue, particularly the head. Limestone masonry was used to fill in the "missing" area just under the headdress. (Hassan speculated that before the repairs were made, there was the possibility that a major storm could cause the Sphinx's head to come crashing down.) Also, various cracks and open grooves in the head and headdress were filled in and smoothed over, as is evident when comparing photographs of the Sphinx taken prior to the repairs with the state of the Sphinx today (Hassan 1949, 24-25). Additionally, holes in the back, on the top of the head, and between the breast of the Sphinx and the Dream Stela were filled in or covered over.

Upon taking over the Sphinx excavations in 1936, one of the first things Hassan did was to demolish the walls that Baraize had erected. As Hassan describes the situation when he took charge, "the actual court of the Sphinx, as well as most of its temple, was comparatively free from sand, and merely needed some cleaning. But this was only for a very limited area, and the remainder of the surroundings of the Sphinx were wholly encumbered with fine, loose sand, stones and debris, the accumulation of the ages, to say nothing of the ruins of mud-brick buildings of different periods" (Hassan 1949, 34).

Hassan’s goal, which he achieved admirably, was to fully excavate down to the bedrock and completely clear a wide area around all sides of the Great Sphinx, the Sphinx and Valley Temples, and the Sphinx Enclosure. To accomplish this, Hassan used a system of wagons or trucks on tracks (similar to the system used by Maspero) by which the laborers were able to move 1,300 cubic meters of sand a day. However, in the process not only were Baraize’s walls demolished, but a number of “later mud-brick structures” were as well (Hassan 1949, 36); that is, structures that postdated the Sphinx and its associated structures. Many, if not all, of these structures demolished by Hassan probably dated to the New Kingdom through Roman times. Hassan did make a particularly significant discovery, however, during these excavations. To the northeast of the Great Sphinx, he found a chapel that Amenophis II (Amenhotep II; the predecessor of Tuthmose IV, he reigned ca. 1427–1401 BCE) had dedicated to the Sphinx under the name of Harmakhis. Based on inscriptions and artifacts found on, in, and around the chapel, Hassan determined that it had been used and added to by several pharaohs, down to Ramesses IV (reigned ca. 1155–1149 BCE). Given the level of the stratum on which this chapel was built (a corner of the chapel was originally situated on top of a corner of the Sphinx Temple), apparently even at that time, more than three millennia ago, the Sphinx Temple (and therefore presumably the Valley Temple as well) was completely engulfed in sand and debris and was unknown to the New Kingdom Egyptians.

Fig. 2.22. The Great Sphinx, Second Pyramid, Third Pyramid, a portion of the Sphinx Temple excavated, and the Valley Temple (to the left), circa 1930s. (Collection of R. Schoch.)

Fig. 2.23. The Great Sphinx with the Second and Third Pyramids in the background, circa 1930s, from a glass lantern slide, published by Edward Van Altena, New York City. (Collection of R. Schoch.)

Fig. 2.24. The Sphinx Temple with the Great Sphinx and the Second Pyramid in the background. (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 2.25. The Sphinx Temple (foreground) and Valley Temple (background). (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 2.26. View looking down into the interior of the remains of the Sphinx Temple. (Photo courtesy of R. Schoch and C. Ulissey.)

Evidently very proud of his discovery, Hassan had the Amenophis II chapel fully reconstructed using locally made mud bricks to construct new walls around the surviving ancient doorposts and lintels, and incorporating within the chapel an original large limestone stela and other objects. Hassan had the structure roofed over in the fashion that he imagined the original must have been. He did admit to cheating a bit in his reconstruction, however; he used burnt (baked) brick pillars and iron girders internally for added support. Not everyone appreciated these efforts. As Hassan complained,

> When this restoration was complete, it was approved of by many persons, experts and otherwise, but in spite of this, no sooner had I left the Antiquities Department than this restoration was promptly demolished, and for some time the stela and sculpted door-ways

were left exposed to the elements. Finally, the inscribed monuments were covered over with unsightly wooden planks, and thus the temple has remained ever since [that is, until the time of his commentary, in 1949; it has since been partially "restored" once again].

It seems that the ancient custom of destroying a predecessor's monuments did not die out at the end of the Pharaonic Regime, after all! (Hassan 1949, 42; comments in brackets by R. Schoch)

Hassan's reconstruction of the chapel and its subsequent dismantling, the restorations and repairs to the Sphinx undertaken at the direction of Baraize, and various subsequent and continuing repairs to the great statue do raise a number of thorny issues. Today the Sphinx's paws in particular have the appearance of being covered by mittens or encased in casts (as when one breaks a bone) composed of bright new limestone blocks, as is indeed the case. Yes, the paws were covered over with limestone repair blocks in ancient times, but ancient repairs are one thing and modern—obviously modern—repairs are another. On more than one occasion I have watched as laborers tediously cut out new limestone blocks and added them to the Sphinx, recasting and reshaping the monument before my eyes. The image that consistently has come to my mind is someone painting over Leonardo da Vinci's *Last Supper* because the paint has faded and flaked in places. There is probably no correct or single answer to questions involving to what extent the Great Sphinx, or any other ancient structure, should be "restored," but it is a topic that should be openly discussed. Every site, every structure, has its own considerations.

In the case of the Great Sphinx, there was concern that not just a storm, but also a war might dislodge the head from the body. To help protect against such a contingency, during World War II a column of stone, sand, and debris was built up under the chin of the Great Sphinx to help support it if the statue came under attack.

Fig. 2.27. The New Kingdom chapel that Amenophis II dedicated to the Great Sphinx; in the background is the Great

Pyramid.
(Photo courtesy of R. Schoch and C. Ulissey.)

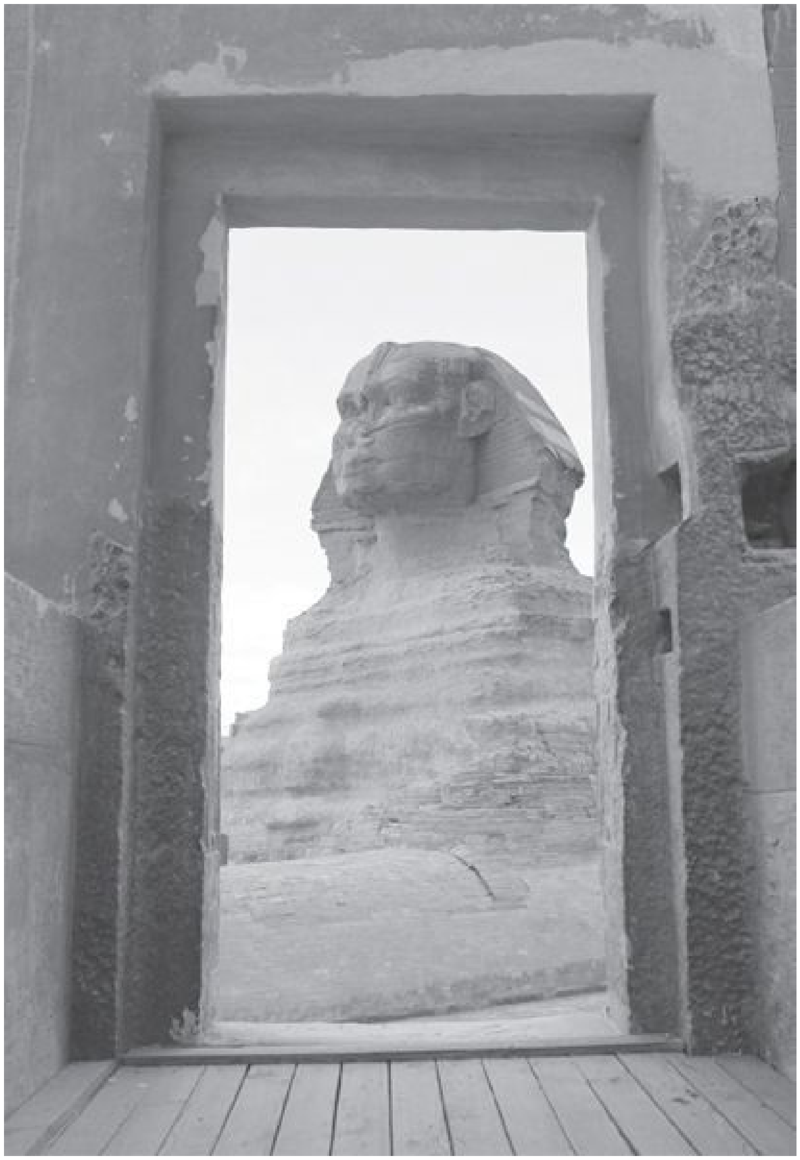


Fig. 2.28. View of the Great Sphinx through the doorway of the New Kingdom chapel that Amenophis II dedicated to the Great Sphinx.
(Photo courtesy of R. Schoch and C. Ulissey.)

Since World War II the Great Sphinx has remained clear of sand, and it has been studied and restudied by a succession of archaeologists and researchers, many of whom are mentioned throughout this book.

Fig. 2.29. The Great Sphinx with the head supported by a column of rock and other material, circa early 1940s/World War II era, with two American (?) servicemen posing. (Collection of R. Schoch.)

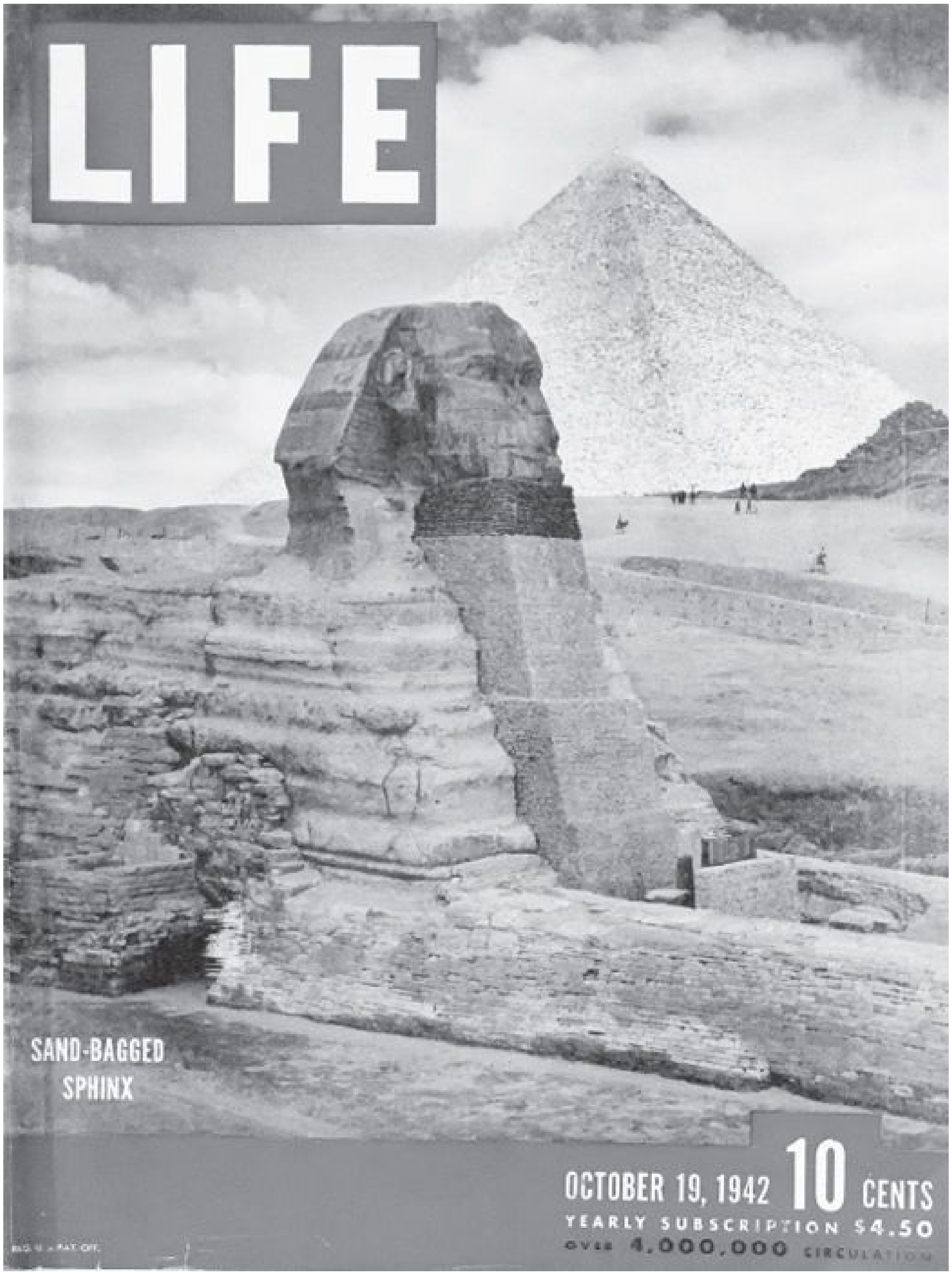


Fig. 2.30. The "Sand-Bagged Sphinx" on the cover of LIFE *magazine, October 19, 1942. (Collection of R. Schoch.)*

PENETRATING BELOW THE SURFACE: SEISMIC TECHNIQUES APPLIED TO THE SPHINX

Another form of "excavation," excavation without actually turning over a shovel of dirt or sand, has been carried out around the Great Sphinx—namely penetrating below the surface of the floor of the Sphinx Enclosure using geophysical techniques. While some such studies were carried out in the 1980s, an extensive suite of new data was collected in April 1991. I am referring, of course, to my own work done in conjunction with the geophysicist Thomas Dobecki (who handled all of the equipment and related technical aspects) as part of my investigations of the Great Sphinx (Dobecki and Schoch 1992). In particular, we carried out low-energy seismic investigations. The specific technique used was to strike a five-kilogram sledgehammer on a steel plate that we laid on the surface of the ground. This provided an energy source that penetrated into the rock and then reflected and refracted off of different subsurface features and rock and weathering layers; the energy waves returning to the surface were recorded by a set of twenty-four geophone receivers placed at selected spots in a line along the ground.

Four seismic lines were taken around the Great Sphinx within the Sphinx Enclosure: one on the north side running parallel along the length of the body of the statue (labeled S1), a second taken south of the Sphinx also running parallel along the length of the body (S2), a third (S3) taken along the western end of the Sphinx just behind the rump and perpendicular to lines S1 and S2, and a fourth line (S4) taken along the eastern end in front of the paws and perpendicular to lines S1 and S2. All four of these lines were taken directly on the surface bedrock, which in each case was effectively the Rosetau Member (as designated by Gauri 1984; see discussion below in this chapter and in appendix 6, note 18).

Here it is important to briefly explain that the Great Sphinx and the Sphinx Enclosure are composed of bedrock limestone, specifically a limestone that is generally considered to be part of, or correlated with, the Mokattam Formation of the Gebel Mokattam area, east of Cairo. The rocks themselves, in geological terms, date to the upper middle Eocene epoch to lower upper Eocene epoch; that is, they are about forty million years old. They contain various fossils, such as nummulites, echinoids, mollusks, and so forth. I have had more than one person show me a fossil shell found on the Giza Plateau, insisting that their "discovery" proves that the pyramids and Sphinx were once under water, and thus such "evidence," they assert, supports my "water erosion theory" of the Great Sphinx (see chapter 7). I have faced indignant remarks when I inform such "supporters" that their discoveries have no bearing on the age of the Sphinx, and in a few cases I have been vilified for not believing that such sea organisms are relevant to the issue of when the Sphinx was carved and the pyramids built. In reality, these fossils pertain to the formation of the limestone, millions of years before humans inhabited Earth, not to the carving of the Great Sphinx or to the Sphinx's subsequent history.

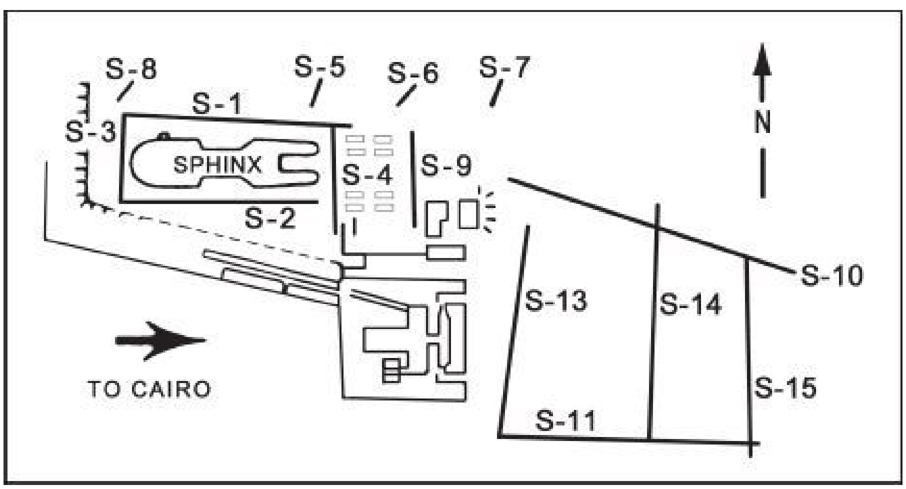


Fig. 2.31. Location map showing various seismic lines taken around the Great Sphinx, April 1991. (Courtesy of R. Schoch and C. Ulissey.)

The Mokattam limestones of the body of the Great Sphinx and the Sphinx Enclosure have, in the archaeological literature, generally been divided into three informal units or members, based on lithological differences that are readily evident to the casual observer. It is sort of like the layers of a cake, with smaller layers contained within the major layers. Different numbering schemes, and it appears possibly slightly different demarcations of the boundaries for the units, have been applied by different authors. Thus, American Egyptologist Mark Lehner (1980, 13) distinguished "Bed 1" as the "harder limestone" that forms the head of the Great Sphinx. Lehner's "Bed 2" consisted of the relatively softer limestone that forms the majority of the core body of the Sphinx, which he described as follows: “The salient characteristic of Bed 2 is a succession of yellow bands, which may be due to limonite, running horizontally through the core-body of the Sphinx. Here, as with the side of the Khafre causeway just to the S [south], the yellowish bands of the softer layers have eroded much more severely than the intermediate harder layers in Bed 2, leaving a profile of successive rolls or sharp undulations” (Lehner 1980, 13).

Lehner’s “Bed 3” consists of the relatively harder limestone below his “Bed 2,” exposed both in the lowermost section and floor of the Sphinx Enclosure and in the Sphinx Temple foundation. He wrote, “The lower terrace of the Sphinx Temple is cut down into the lowest [that is, lower than his Beds 1 and 2] Bed 3, again a hard limestone like the head” (Lehner 1980, 13; material in brackets added by R. Schoch). Here I also need to note that Lehner assumed that his Bed 1 once covered a good portion of the plateau and was since quarried or excavated away or otherwise removed. In this context he wrote, “The original plateau rose here at least to the present height of the Sphinx’s head” (Lehner 1980, 15). However, this was probably not the case; the rock of the Sphinx’s head may well have been, prior to being carved in remote ancient times, a harder knoll that withstood the general natural weathering and erosion around it and formed an erosional remnant that stood above the general level of the Giza Plateau when it was first inhabited and used by ancient peoples prior to and during dynastic times. (See the discussion of the “yardang hypothesis” in appendix 6, note 9, here, and the concept that the original head was a prominent rock outlier discussed in appendix 7, here; see also the discussion in chapter 1 (here.)

British geologist Colin Reader (2002) distinguished approximately the same units as Lehner did in 1980, but referred to them as “members,” used Roman numerals to designate them, and numbered them from the bottom up. Thus, Reader’s Member I is approximately equivalent to Lehner’s Bed 3, Reader’s Member II to Lehner’s Bed 2, and Reader’s Member III to Lehner’s Bed 1.

These beds or members were semiformalized by K. Lal Gauri in 1984 when he designated the neck and head of the Sphinx as the Akhet Member, the majority of the core of the body of the Sphinx the Setepet Member (the majority of the southern wall and the upper western wall of the Sphinx Enclosure is composed of the Setepet Member), and the very base of the body of the Sphinx and the floor of the Sphinx Enclosure the Rosetau Member. In geological stratigraphy, one normally names and designates “type localities” for new formal units, such as geological members, and it is good practice where possible to designate type localities that are easily accessible and can be sampled and studied. Unfortunately, Gauri’s effective designation of the Sphinx and the Sphinx Enclosure as the type locality for these members means that they are pragmatically off limits for serious up-close study by most geologists and other interested people; indeed, as defined by Gauri (1984), the Akhet Member apparently consists only of the head of the Sphinx. These members and layers do not sit perfectly horizontally, but dip slightly southeast. (Thus, the lowermost member, the Rosetau Member, is exposed at a higher elevation at the northwestern end of the Sphinx Enclosure than the southeastern end.)

Returning to the subject at hand, all four seismic lines were effectively taken on the bedrock surface of the Rosetau Member. This is an important point to stress, as some of my critics have claimed that the seismic lines taken around the Sphinx were sampling different units or layers or types of rocks and that this nullifies the conclusions I will discuss shortly. From the beginning I took such considerations into account, and for some to claim otherwise indicates either a lack of understanding of the geology of the Sphinx and the Sphinx Enclosure or simply the desperation of my opponents to refute my conclusions even if it means making false accusations. (The geophones used for a small portion of the eastern end of line S2, and possibly a small portion of the southern end of line S4, may have been physically placed on the weathered remains of the Setepet Member overlying the Rosetau Member. It was difficult to determine the boundary between the two members in the southeastern floor of the Sphinx Enclosure at the time we did the work due to surface debris, although the boundary is evident in the southern wall of the Sphinx Enclosure. Where sampled seismically on the far eastern end along line S2 and the far southern end of line S4, possibly on the order of centimeters worth of weathered Setepet Member material may have overlain the surface of the Rosetau Member; but if so, this exceedingly thin layer of Setepet Member material overburden was effectively invisible to the seismic techniques used, and thus all four lines, S1 through S4, were effectively taken directly on the Rosetau Member.)

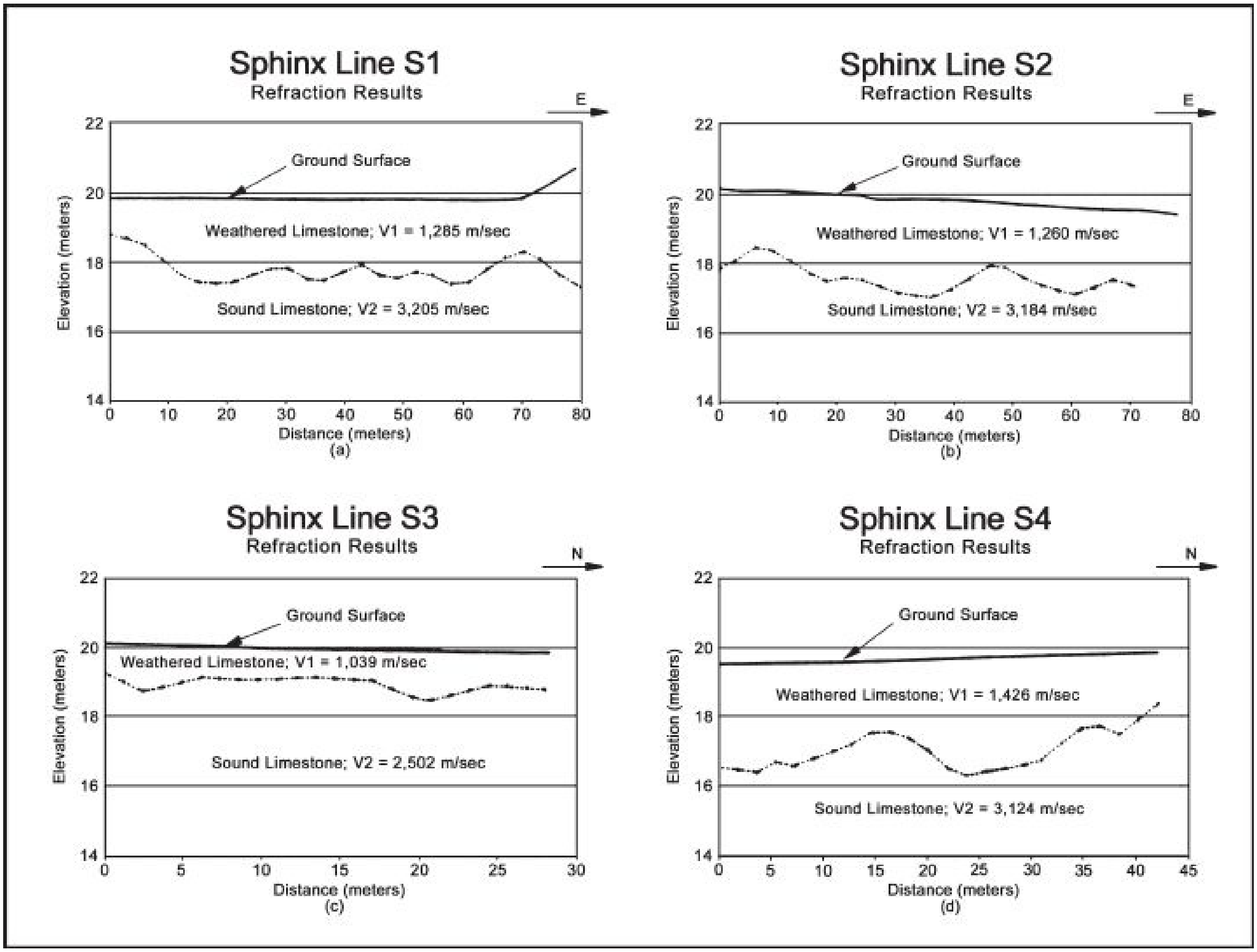


Fig. 2.32. Seismic refraction profiles in the Sphinx Enclosure. (a) Line S1 taken parallel to the body of the Sphinx on its north flank. (b) Line S2 taken parallel to the body of the Sphinx on its south flank. (c) Line S3 taken along the western end, or rump, of the Sphinx and perpendicular to lines S1 and S2. (d) Line S4 taken along the eastern end of the Sphinx Enclosure, in front of the paws of the Great Sphinx and parallel to line S3. (Courtesy of R. Schoch and C. Ulissey.)

The seismic refraction profiles of the four lines taken around the body of the Sphinx consistently showed two distinct layers in the subsurface: an upper layer of weathered limestone overlying a more competent limestone. This was expressed in the differing wave velocities seen in the upper layer (1,039 to 1,426 meters/second) versus the lower layer (2,502 to 3,205 meters/second). Here I want to stress that the weathered upper layer is still hard by everyday standards; if one were to pound one's fist with sufficient force on this "weathered" surface, one could still break bones! As Dobecki and I wrote in our technical paper on the seismic work, "[The weathered upper layer is] primarily due to subsurface dissolution, chemical weathering, and karstic development under subaerial conditions since the time that different portions of the floor of the Sphinx Enclosure were first excavated and exposed. . . . There is no soil/sand layer within the Sphinx Enclosure" (1992, 535; material in brackets inserted by R. Schoch).

If the body of the Great Sphinx had been carved down to the current level of the floor of the Sphinx Enclosure all at one time, as classical Egyptologists have asserted, then the depth of subsurface weathering on all four sides should be approximately the same. However, this is not the case. Along the north and south flanks of the Sphinx (lines S1 and S2) the subsurface depth of weathering is approximately 1.8 to 2.5 meters. Along line S4 east of the paws of the Sphinx the subsurface weathering is likewise about 2 to 2.5 meters deep. (In places it appears on the profile of line S4 to be slightly deeper, in the range of 3 to 3.5 meters, but this is likely due to a cavity and fracturing of the rock, as discussed below.) Along line S3, taken behind the rump of the Sphinx, the subsurface weathering is only about 1 to 1.2 meters deep. As Dobecki and I wrote in our technical paper of 1992, "This suggests varied periods of subaerial exposure for different portions of the excavation" (542).

To put it simply, the core body of the Sphinx was not all carved out from the bedrock at one time or during one period. Rather, the major portion of the body was carved out initially down to the floor of the present Sphinx Enclosure, but originally the lower portion of the rump area of the Sphinx's body merged with the bedrock. The western end of the Sphinx was not totally unexcavated at this early stage, but excavated only down to what I refer as the western terrace level currently seen behind the rump of the Sphinx. To this day, the area of the western end of the Sphinx Enclosure is two-tiered; there is a lower wall (composed of rock of the Rosetau Member) with its base at the current level of the floor of the Sphinx Enclosure. This lower wall rises several meters to an upper flat level or terrace (western terrace; basically the upper stratigraphic surface of the Rosetau Member); the back wall (composed of rock of the Setepet Member) of the western terrace forms the western boundary of the Sphinx Enclosure. Thus, at this early stage there were still several meters of unexcavated bedrock at the current level of the floor of the Sphinx Enclosure immediately behind the current rump. The far western wall shows evidence of pre-Sahara weathering and erosion (see discussion in chapter 7), whereas the lower wall immediately behind the rump of the Sphinx does not show such pre-Sahara weathering (this is the case, in my assessment, even after taking into account that the lower wall is carved from the Rosetau Member whereas the upper and far western wall is carved from the Setepet Member), which is evidence that the western end of the Sphinx Enclosure was carved down only to the level of the western terrace at an early period.

Once a surface of rock is exposed, such as the excavation and exposure of the bedrock floor of the Sphinx Enclosure, it begins to weather. The 1- to 1.2-meter depth of weathering measured at the western end of the Sphinx Enclosure (line S3) is compatible with an excavation of this area during the time of the Old Kingdom, circa 2500 BCE, at the latest. (Note that Zahi Hawass has asserted that the entire core body of the Great Sphinx was covered with limestone blocks in Old Kingdom times, thus confirming that the western end of the Sphinx Enclosoure was fully excavated at this time; see appendix 7, p. 388.) In my assessment, the ancient Egyptians at this time carried out various excavations and restorations to a preexisting statue (as we definitely know occurred during New Kingdom times, a millennium later; see discussion below). During these restorations they appear to have fully carved out the rump of the Sphinx down to the level of the rest of the body along the flanks and in front of the paws.

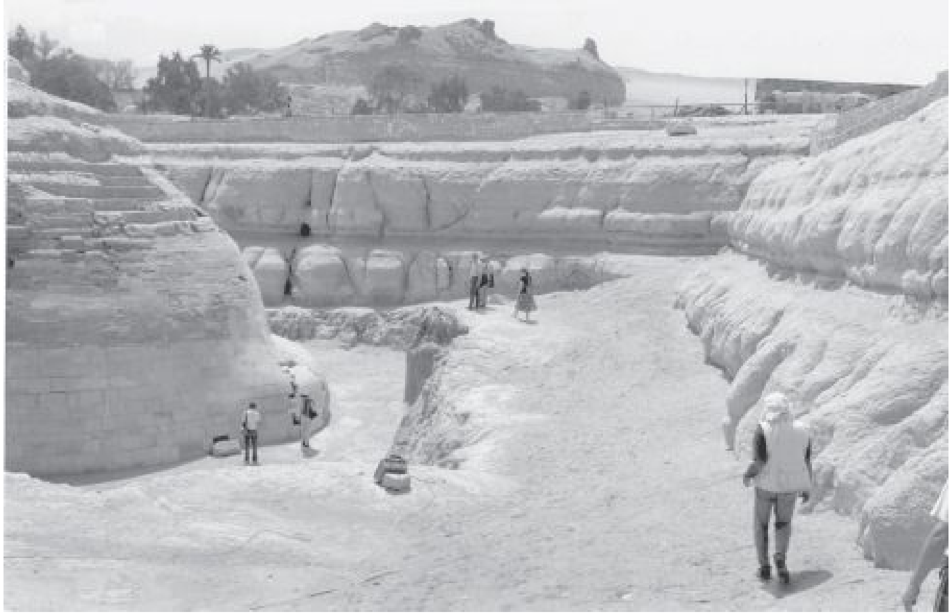


Fig. 2.33. View of the western end of the Sphinx Enclosure. The rear or rump of the Great Sphinx is seen on the left and the two-tiered western wall on the right.
(Photo courtesy of R. Schoch.)

Fig. 2.34. Another view of the western end of the Sphinx Enclosure.
(Photo courtesy of R. Schoch and C. Ulissey.)

Using the depth of subsurface weathering, we can calculate when the original floor of the Sphinx Enclosure was exposed, and thus date the original carving of the core body of the Great Sphinx. (The head is, in my assessment, a dynastic recarving.) My initial "conservative" (that is, estimating the age of the original Sphinx as young as possible) calculation was that it took approximately 4,500 years for the weathering observed along line S3 (western floor of the Sphinx Enclosure) to reach a depth of 1 to 1.2 meters. Thus, since the depth of weathering along the other three lines (northern, southern, and eastern floors of the Sphinx Enclosure) is 50 percent (1.8 meters) to approximately 100 percent (2.5 meters) deeper than the 1.2 meters of line S3, then the original core body of the Sphinx was carved out at least

50 percent to 100 percent earlier than about 4,500 years ago. That is, with rounding, the core body must date back some 2,200 to 4,500 years earlier than 4,500 years ago, which would place it at a period of 6,700 to 9,000 years ago (4700 BCE to 7000 BCE). Rounding to the nearest millennium, this would date the original monument back to circa 5000 BCE to 7000 BCE.

However, more than two decades after my original analysis, I am now convinced that this initial calculation underestimates the age of the monument's origins. I used a simple linear extrapolation; however, in fact subsurface weathering rates typically proceed nonlinearly. The deeper the weathering penetrates below the subsurface, the slower it proceeds due to the fact that the overlying material is still in place and protecting the underlying material to a certain extent. Thus, 50 percent to 100 percent deeper weathering does not translate directly into 50 percent to 100 percent older, but rather it must be still older than any such minimum estimates. In my assessment, the depth of weathering along lines S1, S2, and S4 is compatible with an original date for the core body of the Sphinx going back to at least several thousand years earlier than my initial "conservative" estimates. Another way to consider the data is to note that the most shallow depth of weathering along line S3 (along the rump) is about 1 meter, whereas the depth of weathering on the other three sides can in some cases penetrate down to 2.7 meters or greater. Again, using a linear "conservative" calibration and assuming a date of 4,500 years ago for the western end (which in my assessment is a minimum date; it could be older), then the original core body of the Sphinx is minimally 2.7 times older than 4,500 years ago, giving a date after rounding of circa 10,000 BCE. All in all, I suspect that the proto-Sphinx was in existence prior to the end of the last ice age (that is, prior to 9700 BCE) and was contemporaneous with other structures, such as the oldest portions of Göbekli Tepe in southeastern Turkey (see Schoch 2012), which date to this early period. Put simply, the seismic data are compatible with an initial date of circa 10,000 BCE (or even a bit earlier) for the core body of the Sphinx. There is no doubt in my mind that the seismic data alone, independent of any other evidence—such as surface weathering and erosion, which I discuss in chapter 7—strongly support the hypothesis that the origins of the Great Sphinx predate dynastic times by many millennia.

There are several other points that need to be made here regarding the use of the subsurface profiles to estimate a date for the core body of the Great Sphinx. Some of my critics have asserted that the rock under the floor of the Sphinx Enclosure is harder and more resistant to weathering on the western end than on the eastern end and that this supposed "fact" accounts for the differential subsurface depth of weathering from west to east. Other critics have asserted that the seismic profiles are simply mapping southeastern-dipping strata below the floor of the Sphinx Enclosure, and not a subsurface weathering layer at all. I considered such possibilities long before I announced my findings and conclusions, and both of these assertions are incorrect.

Regarding the notion that the rock is harder at the western end of the Sphinx Enclosure, Dobecki and I addressed this directly in our original 1992 paper, where we pointed out that either the rock at the western end is of the same hardness as under the rest of the Sphinx Enclosure or possibly it is softer. This evidence contradicts the unfounded assertion of my critics. Dobecki and I stated, "Line S3, running north–south behind the rump of the Sphinx, exhibits somewhat slower velocities than do the other three lines in the Sphinx Enclosure. Due to space limitations, this line was shorter than the other lines, and the geophone spacing was somewhat closer. The slower velocities recorded on line S3 may be due to the more limited range of offset on this shorter line or, quite simply, the natural bedrock in this area may be less hard than along the other three sides of the sphinx" (1992, 536).

Furthermore, countering the "soft rock to the east" theory of some of my critics, when we carried out a seismic refraction tomography study of the subsurface under the Sphinx (discussed below) we found a high-velocity anomaly along the middle northern flank of the Sphinx that probably represents "a zone of very hard, massive limestone with little natural fracturing" (Dobecki and Schoch 1992, 540). Yet this is also an area where, in the profile of line S1, the subsurface weathering is consistently deep (around 2 to 2.5 meters). If the "soft rock to the east" theory were correct, this should be an area of soft rock, not very hard rock!

Regarding the notion that the seismic profiles are simply mapping southeastern-dipping strata below the floor of the Sphinx Enclosure, and not a subsurface weathering layer, this is refuted by the geometry of the profiles as compared with the actual dip of the strata (rock layers) as observed directly on the walls of the Sphinx Enclosure. The rock strata dip from the northwest to the southeast. The subsurface profiles seen in lines S1 and S2 are relatively horizontal (see further discussion of S2 below). They do not dip to the southeast; they do not consistently record increasing depths below the subsurface to the east. Rather, the profiles cut across the southeastern-trending dip of the rocks, thus negating the assertion of the critics who propose that these profiles are mapping rock layers and not subsurface weathering.

In the profile of line S2 (taken along the southern flank of the Sphinx), at the geophone locations of about 45 to 49 meters (measured from west to east in the Sphinx Enclosure), near a cupola (from the Roman era?) along the side of the Sphinx, in the subsurface profile it appears that the depth of weathering is only about 2 meters or slightly less. However, this appearance of thinner subsurface weathering may not be real, but an artifact due to a subsurface void or cavity in this area (Dobecki and Schoch 1992, 535–536), consistent with a collapsed tunnel-like feature running under and along the length of the Sphinx, as detected in the seismic refraction tomography analysis (discussed below). Taking this into account, the true depth of weathering in this section of the profile of line S2 is most likely comparable to the depth on either side, namely in the range of 2.5 meters.

Using a technique known as refraction tomography, it was possible to map subsurface features under the Sphinx as indicated by differing seismic velocities. When this was done, one high-velocity seismic anomaly (which we labeled D) and three low-velocity anomalies (labeled A, B, and C) were evident. Anomaly D is the hard and massive limestone on the northern flank of the Sphinx mentioned above. The low-velocity anomalies suggest or indicate voids, cavities, or chambers in the bedrock under the Sphinx and below the bedrock floor of the Sphinx Enclosure.

The most prominent low-velocity anomaly, Anomaly A, is centered under the left paw of the Sphinx. It is in the same area where previous studies were conducted (Dolphin 1981; Yoshimura et al. 1987, 1988). Based on our seismic data, Anomaly A indicates that there is a rectangular cavity or chamber under the left paw of the Sphinx. In the plan view, it is about twelve meters long in an east-west direction by nine meters wide in a north-south direction, and it may lie approximately five meters below the current level of the floor of the Sphinx Enclosure. (It is difficult to estimate its depth.) The low seismic velocities also suggest that it may be fractured or collapsed, or perhaps it contains artifacts that are contributing to the low seismic velocities. (This might be indistinguishable from a chamber that is simply collapsed.) Based on the relative regularity of this void or cavity, it appears that it is most likely artificial (human made), although it may be a natural cavity in the rock (formed secondarily in the limestone bedrock by faulting and/or dissolution of the rock by flowing groundwater, in the same way that limestone caves form in many areas) that was later enhanced by human activity.

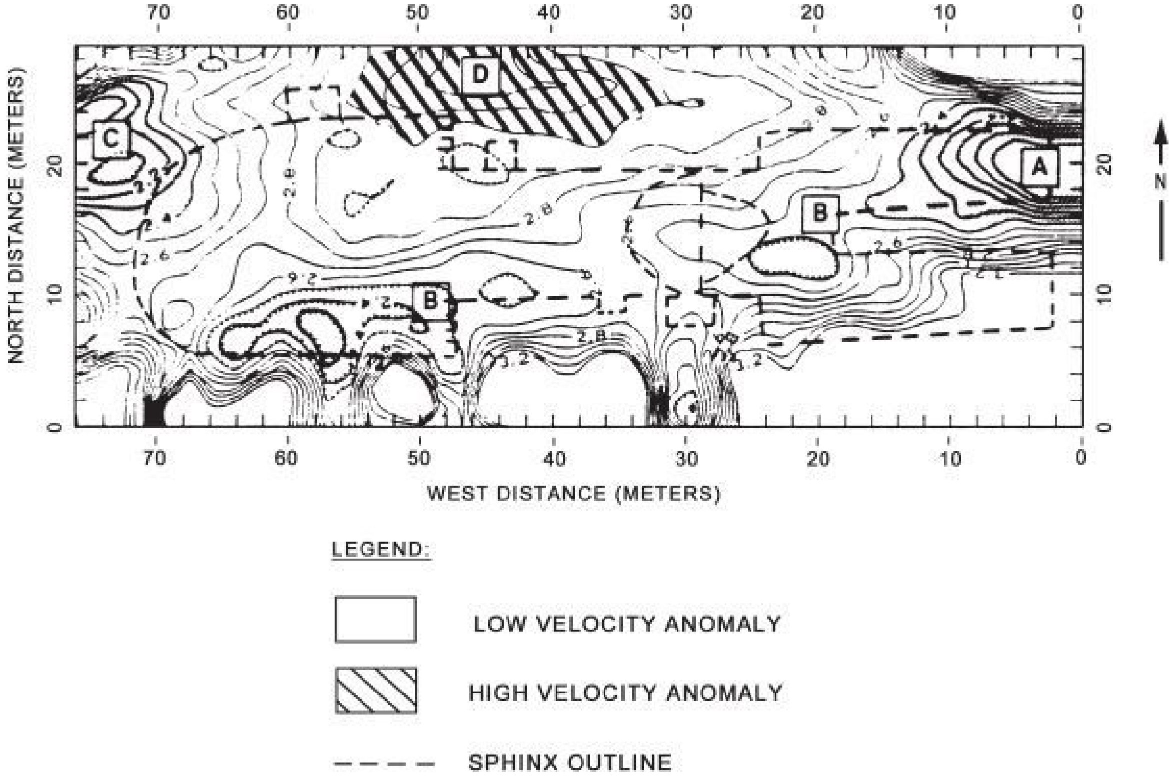


Fig. 2.35. Seismic velocity map beneath the Great Sphinx as determined by refraction tomography. The outline of the Great Sphinx is shown as a dashed line. (Courtesy of R. Schoch and C. Ulissey.)

Anomaly B is a low-velocity linear feature extending from approximately the southwest corner of Anomaly A to the southwest end of the Sphinx (the right rump and tail region of the statue). It is somewhat discontinuous and may represent a tunnel, perhaps partially collapsed.

Anomaly C is a low-velocity feature indicative of a void or cavity in the area of the left rear rump region of the Sphinx. Possibly this corresponds, at least in part, to a known cavity or void in this region of the Sphinx.

As part of the seismic investigations carried out in the vicinity of the Sphinx, a seismic line (S10) 120 meters in length was run in the area in front of (east of) the Sphinx Temple. This line was oriented approximately west to east (oriented slightly to the southeast rather than running directly east) and crossed the ground surface of sand (present in April 1991) toward a restaurant. The seismic refraction profile of line S10 revealed what lies under the sand. On the western end, near the Sphinx Temple, the limestone bedrock was found to lie only one to two meters below the sandy ground surface, but at a distance of some forty meters along the line toward the east, the subsurface bedrock dropped off eight or nine meters vertically over a short length of just a few meters horizontally, indicating a cliff-face-like structure under the sand, and the bedrock continued to drop off to a depth of more than eighteen meters below the current ground surface near the restaurant. In this profile (line S10) the interface between dry sand (above) and water-saturated sand (below) was located, indicating the depth of the water table. Toward the middle and eastern portions of the line, the water table was found to be at a depth of about four to five meters below the surface (at an elevation of about fifteen meters above mean sea level; the floor of the Sphinx Enclosure is approximately twenty meters above mean sea level).

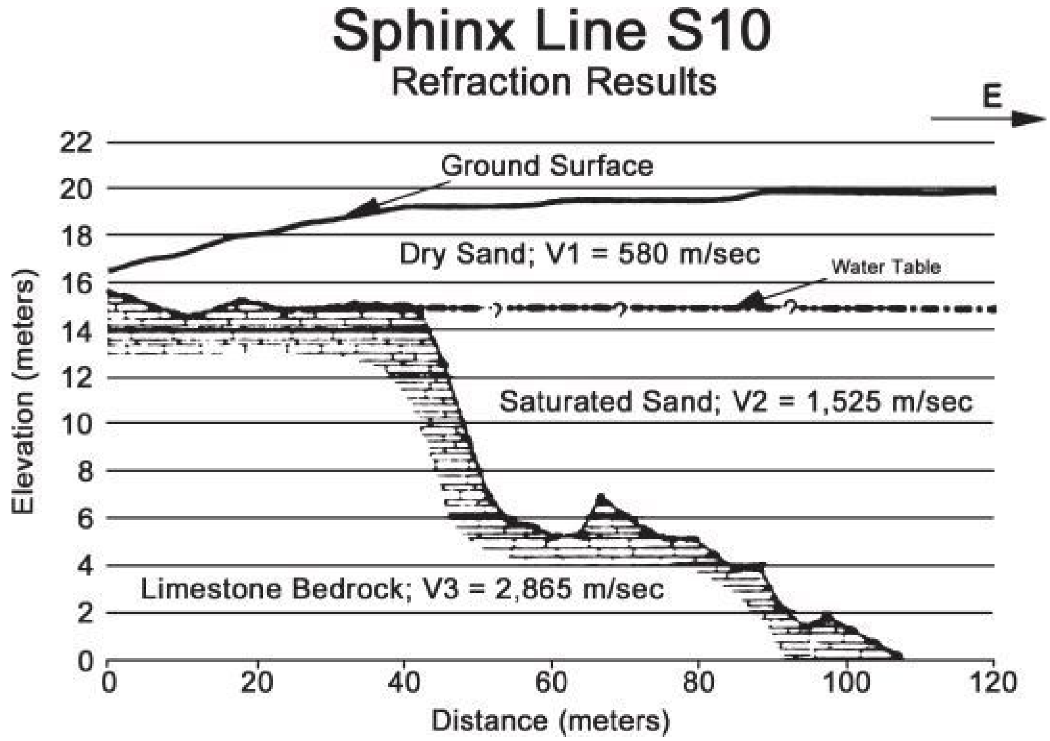


Fig. 2.36. Seismic refraction profile taken along Line S10 in the area east of the Sphinx Temple (see fig. 2.31 for location). (Courtesy of R. Schoch and C. Ulissey.)

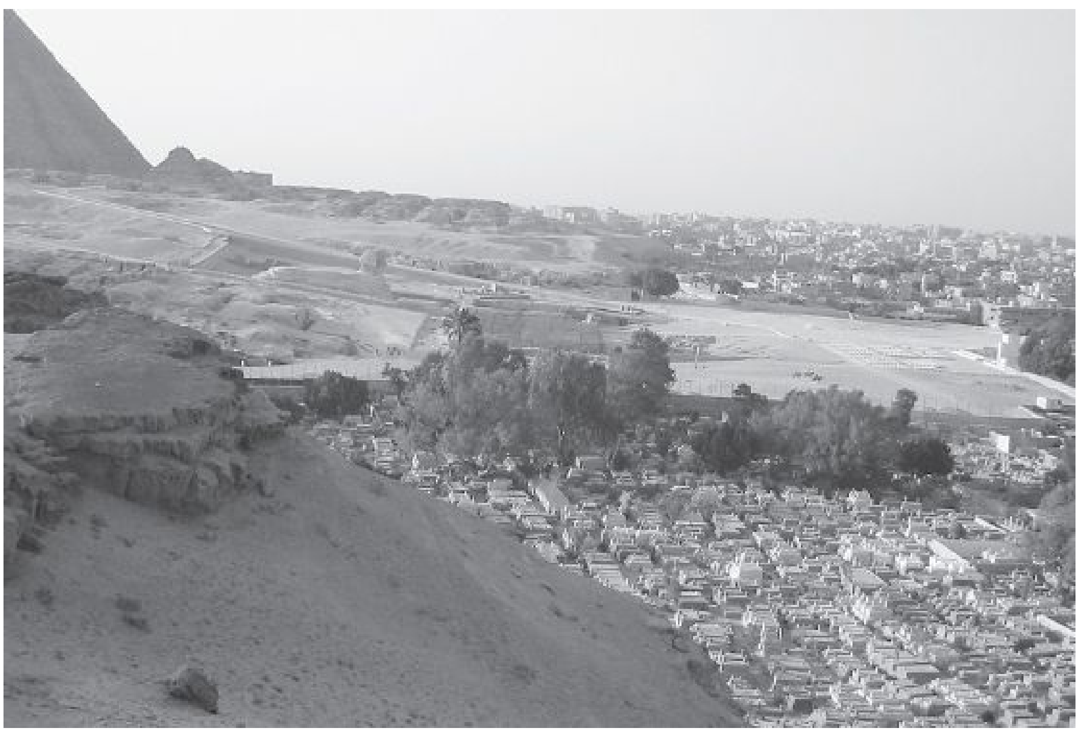


Fig. 2.37. View from the south, looking north, showing the Great Sphinx on the left and the area to the east currently covered by sand.
(Photo courtesy of R. Schoch.)

Many people have asked me where the entrance to the chamber under the left paw of the Sphinx (discussed above) might be found. I speculate that it may be located in the cliff face east of the Sphinx Temple, now buried under meters of sand. Furthermore, at one time when the cliff was free of sand and debris, and thus visible, it would have presented a majestic sight to someone approaching the cliff from the east. Imagine looking up at the cliff to view not just the Sphinx Temple (and the Valley Temple to the left, that is south, of the Sphinx Temple), but also the Great Sphinx itself (which at that time might not have been an actual Sphinx, but perhaps a recumbent lion) towering behind and over and above the Sphinx Temple. Indeed, a recollection of this view might be recorded on the Dream Stela of Tuthmoses IV (as well as on other stelae) in the form of the Sphinx situated on top of a templelike structure.

A curious aspect of the chamber under the left paw is the interest that certain people have shown in it. In particular, unknown to me in 1991 was the fact that the American psychic Edgar Cayce (1877–1945) had indicated (during his “trances” and “channeling sessions”) that the ancient continent of Atlantis had been destroyed circa 10,500 BCE and that the survivors had dispersed to various parts of the globe, founding new offshoot civilizations. One place the Atlanteans colonized, said Cayce, was Egypt, apparently constructing the pyramids and carving the Great Sphinx at that time. They also established a library, a “hall of records,” in the vicinity of the Great Sphinx, and by some interpretations of Cayce’s “readings” it was perhaps actually under a paw or the paws of the Great Sphinx. At any rate, Edgar Evans Cayce (1918–2013; one of Edgar Cayce’s sons) of the Association for Research and Enlightenment (which is the repository of Edgar Cayce’s archives and continues his mission) duly contacted me, filling me in regarding Cayce’s work. In his opinion, my research on the Great Sphinx went a long way toward corroborating Cayce. At this point (as I write this in late 2016) the chamber under the left paw of the Great Sphinx has not been probed or entered (at least not to my knowledge). This is a task that I have been keen on undertaking for a quarter century, but the Egyptian authorities have not seen fit to be cooperative in this matter. This may be a time-sensitive issue as well, for the rising water table, due to modern “development” and the current large population of Cairo and its surrounding region, may be flooding the chamber, potentially damaging any artifacts that it contains.

Regarding the Sphinx Temple, a seismic line (S9) was run along the floor (like the floor of the Sphinx Enclosure, composed of the Rosetau Member) of the middle of the temple in a north-south direction. Similar to the lines S1, S2, S3, and S4, this line showed a weathered layer (velocity of 1,257 meters/second) above an unweathered limestone layer (2,881 meters/second). The depth of weathering was approximately 1.2 to 1.5 meters deep in the profile, that is, intermediate in depth between the western end of the floor of the Sphinx Enclosure (S3) and the rest of the floor of the Sphinx Enclosure. This, however, is compatible with the original core body of the Great Sphinx dating back to a period well before Old Kingdom times (ca. 2500 BCE), as well as the original Sphinx Temple (constructed from limestone blocks that were removed from the Sphinx Enclosure during the carving of the core body) also dating to that early period. As Dobecki and I wrote in our original paper, “This relatively shallow depth of weathering, as compared to lines S1 and S2 in particular, may be due to several factors. The limestone surface within the Sphinx Temple was probably originally protected by both a roof and a floor of secondary materials lain upon the limestone bedrock. Also, there is some evidence (such as cut marks around pillars inside the Sphinx Temple which now stand on bedrock pedestals) to suggest that the floor of the Sphinx Temple was lowered from its original elevation in later ancient times” (1992, 536).

I continue to stand by this analysis, and in particular I am of the opinion (based on my direct observations, noted above, concerning the working of the stone inside the Sphinx Temple) that the original floor of the temple was lowered significantly (I suspect in Old Kingdom times), and thus a good amount of the thickness of this upper weathered layer was removed. This lowering combined with a protective floor of secondary materials within the temple can explain the shallower depth of weathering observed along the profile of line S9.

WE WERE NOT THE FIRST: ANCIENT EXCAVATIONS AND RESTORATIONS

Excavating and restoring the Great Sphinx is nothing new. As indicated on the Dream Stela, Tuthmoses IV (New Kingdom, Eighteenth Dynasty, ca. 1400 BCE) excavated and restored the Sphinx, and he erected mud-brick walls around the Sphinx in order to keep out the ever-threatening sands. (During his excavations, Hassan found the remains of these walls, and some of the mud bricks were stamped with the name of Tuthmoses IV.) The inscription on the Dream Stela is fragmentary, but one possible interpretation of its meaning includes the possibility that Tuthmoses IV was aware that his Old Kingdom predecessors more than a millennium earlier had also excavated and restored the Great Sphinx (see chapter 7, p. 248).

Ramesses II (Nineteenth Dynasty, reigned ca. 1279–1213 BCE) ordered that stone be quarried (apparently as opposed to appropriating stone from earlier monuments, such as the pyramids, which at this time were often used as a source of stone for newer structures) to make repairs to the Sphinx. Hassan speculated that these repairs might have been in the form of casing stones on the paws (1949, 7). And, as a reminder, at this time it seems that only the Great Sphinx was known, as the associated Sphinx and Valley Temples were buried in sand and debris.

The Sphinx itself and its *temenos* (the sacred space, for instance, around a temple or chapel, typically marked by walls that separate the area from the profane outside world) may have remained relatively clear of sand for much of the period from the New Kingdom through Roman times, but we cannot be absolutely certain. Since the Sphinx, if left unattended, can be buried in sand in just a few decades, there is the possibility that it was at times neglected and at other times again excavated and repaired. It is an often-noted fact that the Greek historian Herodotus (fifth century BCE), who visited during a period when Egypt was under Persian domination, wrote at some length about the pyramids and other sights on the Giza Plateau, but failed to mention the Great Sphinx. Was this merely an oversight, or was it at this time once again engulfed in sand? Various later historians, such as Manetho (third century BCE), Diodorus Siculus (first century BCE), and Strabo (first century BCE–early first century CE), also failed to mention the Great Sphinx, but this may simply be due to the fact that they were borrowing material from earlier writers, and if a predecessor did not mention something (in this case, Herodotus not mentioning the Sphinx), then it was left out (Zivie-Coche 2002, 15). According to Hassan (1949, 8), there is ample evidence that the Sphinx was worshiped, and even had its own priesthood, around the time of Herodotus’s visit.

As evidenced by Caviglia’s discoveries (many of the material remains he found have since been destroyed or lost, although the information persists), the Sphinx was highly regarded during the Roman era. Pliny (first century CE) mentions the Sphinx and the tourism at that time associated with both the monument and the pyramids (Zivie-Coche 2002, 15, 99–100). As already noted above, inscriptions from the first through early third centuries CE show particular interest in and veneration of the Great Sphinx. There were numerous restorations to the statue itself as well as construction of and repairs to the monumental path and stairways that led to the Sphinx. The Great Sphinx appears to have been a major pilgrimage site and tourist destination until the final collapse of paganism in the late fourth century CE. After that, the sands encroached, surrounded, and buried the statue up to its neck once again.

Still, as Hassan (1949) points out, traces of the cult of the Sphinx lingered among the locals, even after the Arab conquest of Egypt circa 639–642 CE, and various Arab historians and geographers mentioned the Great Sphinx in passing. The Egyptian historian Al-Maqriz (El-Makrizi, died ca. 1442) wrote, “In our time (780 A.H. [1378–1379 CE]), there was a man whose name was Saim-ed-Dahr, one of the Sufis. This man wanted to remedy some of the religious errors, and he went to the Pyramids and disfigured the face of Abul-Hol [that is, the Great Sphinx], which has remained in that state from that time until now. From the time of this disfigurement also, the sand has invaded the cultivated land of Giza, and the people attribute this to the disfigurement of Abul-Hol” (quoted in Hassan 1949, 81–82; parenthetical comment in the original; material in brackets added by R. Schoch).

Presumably it was due to such an incident that the Sphinx lost its nose. And whose face is portrayed on the Great Sphinx? This is a subject we will address in subsequent chapters.

Fig. 2.38. A modern view of the Great Sphinx with the Great Pyramid (right side) and Second Pyramid (left side) in the background.
(Photo courtesy of R. Schoch and C. Ulissey.)

Chapter Three

KHAFRE: TO BE OR NOT TO BE?

Robert Bauval

> *The answer to the riddle of the Sphinx. . . . It is a portrait of Chephren [Khafre] mounted in the usual way on the body of a lion. . . .*
>
> GEORGE ANDREW REISNER

> *[Khafre] commissioned the carving of the Sphinx in the rock of the Plateau of Giza.*
>
> GEORGE ANDREW REISNER

ON THE SHOULDER OF GIANTS

Egyptologists have persistently claimed that the Great Sphinx of Giza is the work of the Fourth Dynasty, and any serious challenger, especially from outside the profession, will automatically face a barrage of opposition. According to one prominent Egyptologist, if someone in the public does not accept this "fact," then he or she is not part of the "intelligent public" (Stadelmann 2000, 464). There are others who are more vociferous against dissenters, labeling them "pseudoscientists," "pseudoarchaeologists," "fame-seekers," "charlatans," "fanciful speculators," and even "Zionists." Take for example the position of British archaeologist Paul Jordan, who is a staunch defender of the Fourth-Dynasty Sphinx consensus. In a book unoriginally titled *The Riddle of the Sphinx,* Jordan lamented, "Egyptologists and archaeologists are truly sorry to see people being misled with nonsense when there is so much real knowledge to hand" (Jordan 1998, 211). What Jordan is implying is that only archaeologists and Egyptologists are to be trusted with "real knowledge" when it comes to ancient Egypt. This patronizing attitude by the likes of Jordan, however, is eclipsed by that of the "world's most famous Egyptologist" Zahi Hawass (and to a somewhat lesser degree by that of his longtime colleague Mark Lehner) toward nonconformists of the Fourth-Dynasty Sphinx consensus. As far as this blustering scholar is concerned the Sphinx belongs to the pharaoh Khafre, and those who do not agree must "shut their mouths" or, at the very least, must be shunned as naive and incompetent "amateurs." We speak, of course, from personal experience and the receiving end of such attacks (Bauval 2014).

LABELING THE TEMPLE

The Sphinx = Khafre story, however, did not start with today's Egyptologists, least of all with Jordan, Hawass, or Lehner. All these self-proclaimed "experts" stand on the shoulders of "giants of Egyptology" of previous generations.

The Sphinx = Khafre story actually begins with the American Egyptologist George Andrew Reisner (1867–1942), who is often described by his peers as "one of the most prominent founding fathers of modern scientific archaeology."

Fig. 3.1. George Andrew Reisner.
(Photo by Bob Davis, June 26, 1933.)

But to appreciate Reisner's role in this conundrum we must flash back to 1858, when the French archaeologist Auguste Mariette discovered a massive granite temple immediately south of and adjacent to the Great Sphinx. Mariette, who was the first director of Egypt's Antiquities Services, was hasty in labeling it the "Sphinx Temple." And because this temple also contained several statues bearing the name of Khafre (including the famous diorite statue that today graces Room 42 of the Cairo Museum), scholars jumped to the conclusion that it, as well as the Sphinx, belonged to Khafre—an assumption, as we shall soon see, that does not necessarily follow when all the evidence is scrutinized with an open mind.

However, fifty years later, in 1908, Reisner discovered a temple east of the Third Pyramid that he labeled the "Mortuary Temple of Menkaure." Reisner then followed the course of the ancient causeway that extended eastward and found at its other end another temple in which were stashed several statues of Menkaure. Reisner labeled this one the "Valley Temple of Menkaure." This led Reisner to propose that the granite temple labeled the "Sphinx Temple" by Mariette should now, in the light of the new discoveries, be relabeled the "Valley Temple of Khafre," a name that has stuck like glue to this day. As for the label of the "Sphinx Temple," this was allocated to another temple *directly in front of the Sphinx*. Reisner then argued that since the Valley Temple of Khafre was next door to the Sphinx, then the Sphinx, by extension, must also belong to Khafre, even though there was no archaeological evidence to support this conclusion. Yet Reisner's speculative conclusion is still unequivocally accepted as *fact*. Indeed, this fact was enthusiastically announced by several American journalists who proudly touted that the riddle of the Sphinx had been finally solved by an American scholar. The popular *Cosmopolitan Magazine* in 1912 proclaimed:

Fig. 3.2. Graham Hancock and Robert Bauval in Room 42 next to the diorite statue of Khafre, Cairo Museum (also known as the Egyptian Museum), 1998.
(Photo courtesy of R. Bauval.)

Fig. 3.3. The statue of Khafre, Cairo Museum, 2016.
(Photo courtesy of R. Schoch and C. Ulissey.)

> The silent watcher [the Great Sphinx] above the Nile is no lon-ger inscrutable. We now know why and by whom it was made . . . Chephren [Khafre], son of Cheops [Khufu], the Builder of the Great Pyramid, who himself carved out the Great Sphinx of Gizeh. . . . The Sphinx was the body of a lion bearing the portrait head of Chephren [Khafre] . . . without doubt it was Chephren [Khafre] who first put into execution the sphinx-idea. . . . Professor Reisner proved that the Sphinx was part of the temple complex of the Second Pyramid and was therefore built by Chephren [Khafre]. (*Cosmopolitan Magazine*, op. cit. 1912b, 4–13; italics added)

To be fair, the journalists cannot be blamed for such a blatant assertion. After all, Reisner's academic credentials were impeccable: he held the prestigious post of professor of Egyptology at Harvard and was also president of the Rotarians in Cairo. Reisner was highly admired, even venerated, by his peers and regarded as the most influential Egyptologist of his time. So if Reisner said the Sphinx belonged to Khafre, then this was final. The few dissenting voices that objected were quickly muzzled by Reisner's notoriety and status. Many decades later, however, the German Egyptologist Rainer Stadelmann made this pertinent remark when discussing the identity of the Sphinx: "Very often in our discipline, old and seemingly certain statements rest forever without further verification . . . this is an indication how much Egyptology tends to believe in written sources, even if they are not evident” (Stadelmann 2000, 465).

Fig. 3.4. One of the three schist statues of the pharaoh Menkaure found by Reisner, Cairo Museum. (Photo courtesy of R. Bauval.)

To be fair, there had been at least one Egyptologist—Selim Hassan—who had studied the Great Sphinx perhaps more than anyone and, most refreshingly, found it necessary to caution his colleagues over the Sphinx = Khafre conclusion: “Excepting for the mutilated line on the Granite Stela of Thothmes IV, which proves nothing, there is not one single ancient inscription which connects the Sphinx with Khafre. So sound as it may appear, we must treat the evidence as circumstantial until such a time as a lucky turn of a spade will reveal to the world definite reference to the erection of the statue” (Hassan 1949, 91).

Selim Hassan’s cautionary remarks, however, were largely ignored . . .

THE BROKEN CARTOUCHE

One of the arguments often used as “smoking-gun” evidence that Khafre commissioned the Sphinx is based on an inscription or, to be more exact, a broken cartouche bearing *part* of Khafre’s name that was found on a New Kingdom (Eighteenth Dynasty) stela, known as the Dream Stela, that was placed between the front paws of the Sphinx; the cartouche is said to have existed on line 13 of the inscriptions.[*10]

According to Stadelmann, this inscription "was and is *the only proof* for the identification of the Sphinx with Khafre" (Stadelmann 2000, 465; italics added). And this alleged proof is cited ad nauseam in most textbooks about the Giza necropolis and especially those by Hawass, who confidently pronounces assertions such as, "The broken cartouche of Khafra at the end of the text of Thutmose IV's Dream Stela set up between the Sphinx's forepaws further suggests that the kings of the Eighteen Dynasty *knew* that Khafra was the builder of the Sphinx" (Hawass 1993, 183; italics added).

It is, therefore, on this alleged proof that we will now focus our attention in this present chapter. The reader is asked to bear with us as we unravel the strange story behind this important inscription. It is, we believe, worth the effort and patience to unwrap the layers of confusion regarding this cartouche, as one does for an anonymous mummy, especially the circumstances of how it was found, then forgotten, then found again, copied, and recopied, which not only makes a fascinating story but also reveals how "evidence" can be manipulated, distorted, altered, or damaged, and more than often misinterpreted. The real problem is this: the so-called Khafre cartouche on the Dream Stela has disappeared. It either broke up due to weathering or, as also has been suggested, it was deliberately removed, although when and by whom no one knows. *So the "proof," that is, the cartouche that Egyptologists keep referring to, is based not on their own examination of it or, at the very least, on actual high-quality photographs, but on the drawings made of it by Henry Salt and others before it disappeared.* The burning question, therefore, is, How reliable and accurate were these early drawings?

As we have already noted, for most of its existence the Great Sphinx was covered in sand, with only the neck and head sticking out. It has been estimated that if left unattended, the drifting desert sand will engulf its body every thirty-five years or so. We have no way of knowing, of course, how many times this happened in antiquity, and thus for how long the Sphinx's body was exposed to the elements such as wind and rain. But what we do know, however, is that the Sphinx was covered up to its neck when an Eighteenth-Dynasty prince, the future king Tuthmoses IV (ca. 1420 BCE), was hunting in the area of the Giza necropolis. Legend has it that the young prince fell asleep under the shadow of the Sphinx's head and dreamt that the statue spoke to him and promised him the crown of Egypt should he free it from the encroaching sand. The prince naturally obeyed and became king of Egypt. To commemorate this event Tuthmoses IV placed a huge granite stela, the so-called Dream Stela, which tells this story, between the paws of the Sphinx.

In 1817 an Italian navigator-cum-archaeologist called Captain Giovanni Battista Caviglia excavated around the Sphinx and discovered the granite stela and also a few fragments of the Sphinx's beard. As Selim explained, "Captain Caviglia commenced to excavate the Sphinx, starting from the north by digging a trench towards the shoulder of the statue. . . . The first discovery of any importance was a fragment of the beard of the Sphinx, and then the head of the uraeus from its brow. A little later, he brought to light the Granite Stela of Thothmes IV" (Hassan 1949, 10–11).

Caviglia also found two other stelae next to the Dream Stela. These belonged to Ramses II, a great-grandson of Tuthmoses IV. Also found was a small statue of a sphinx and the fragments of another. But from this point on the story gets very confusing. It seems that the two stelae of Rameses II were sent to England but somehow ended up in France at the Louvre Museum. The fragment of the beard and the small statue of the sphinx ended up at London's British Museum.[*11] Luckily, and presumably because of its massive size and weight (about fifteen tons), the Dream Stela was left in its original position, where it still stands today.

The Dream Stela is 3.6 meters tall—almost twice the height of a grown man—and 2.18 meters wide, with a thickness of about 70 centimeters. This gives it a weight of some 15 metric tons—equivalent to fifteen family cars! Egyptologists believe that Tuthmoses IV appropriated the granite slab from a door frame of the nearby Valley Temple of Khafre.[†12]

At any rate, the rounded top part of the stela—known to Egyptologists as a *lunette,* which mean "small moon" in French—has depictions of Tuthmoses IV making offerings to two Sphinxes positioned back-to-back, while the rest of the stela has eleven horizontal lines of the original thirty that were inscribed all the way down to the base. Egyptologists believe that it was water erosion that caused the inscriptions to crumble away, but there is evidence that the damage was caused in the 1800s by people chipping pieces off to serve as talismans or to take as memorabilia. The American novelist Mark Twain, who visited the Great Sphinx in 1867, was an eyewitness to such despicable vandalism carried out by an unknown American tourist.

Fig. 3.5. The Dream Stele of Tuthmoses IV.
(Photo courtesy of R. Bauval.)

> There are some things which, for the credit of America, should be left unsaid, perhaps; but these very things happen sometimes to be the very things which, for the real benefit of Americans, ought to have prominent notice. While we stood looking, a wart or an excrescence

of some kind appeared on the jaw of the Sphynx [sic]. We heard the familiar clink of a hammer, and understood the case at once. One of our well-meaning reptiles—I mean relic-hunters—had crawled up there and was trying to break a “specimen” from the face of this the most majestic creation the hand of man has wrought. But the great image contemplated the dead ages as calmly as ever, unconscious of the small insect that was fretting at its jaw. Egyptian granite that has defied the storms and earthquakes of all time has nothing to fear from the tack-hammers of ignorant excursionists—highwaymen like this specimen. He failed in his enterprise. We sent a sheik to arrest him if he had the authority, or to warn him, if he had not, that by the laws of Egypt the crime he was attempting to commit was punishable with imprisonment or the bastinado [beating]. Then he desisted and went away. (Twain 1869)

Fig. 3.6. The Relic-Hunter from Innocents Abroad *by Mark Twain, 1867.*

The orientalist and author Robert Temple has recently found a document published by a friend of Caviglia, Annibale Brandi, where it is reported that the Dream Stela was “*completely full of hieroglyphs very well executed . . . the bottom part there are two crosses, not of the usual form . . .* [but] the discovery of this tablet and of its hieroglyphs has deeply touched the fantasy of the superstitious Egyptian women of the near villages, who come numerous times to touch it and *take some pieces of it*, believing it could help their fecundity” (Temple 2009, 520; italics added).

The first drawing of the Dream Stela was made by Henry Salt in late 1817. This was some thirty years before the first portable photographic cameras were brought to Egypt. Salt was British consul in Egypt and acted as a sort of clearing house for antiquities, and not just for the British, but for whoever paid the highest price. As such he mentored Caviglia, the latter a very keen Anglophile, and used him to find ancient artifacts for his business. At any rate, on Salt’s drawing only lines 1 to 13 of the inscriptions are shown, plus two fragments lower down the stela containing parts of lines 16 and 17 and parts of lines 18 and 19. After Salt made the drawing he had Caviglia cover up the Dream Stela again in sand, presumably to protect it from vandalism or, more likely, protect his business (Temple 2009, 500).[*13]

In 1821 Salt dispatched his sketches of the Dream Stela along with the manuscript of his memoirs as well as other drawings he made of the beard fragments to the British Museum in London. There at the museum the sketches were examined by the linguist Thomas Young, who made a copy of Salt's drawing of the Dream Stela, which he then published in 1823 with the caption: "Tablet of Thebaic granite standing in a small temple between the fore legs of the Sphinx discovered by Captain Caviglia and copied by H. Salt" (Young 1828, plate 80).

Salt died in 1827, and his sponsor and mentor, the second Earl of Mountnorris,[*14] requisitioned from the British Museum all of Salt's documents including the drawing of the Dream Stela. It was at Earl Mountnorris's home that the dilettante archaeologist Colonel Richard William Howard Vyse made a hand-drawn copy of Salt's drawings, which he published in 1842 in his book *Operations Carried On at Gizeh in 1837*, Volume III, written with John S. Perring. Vyse was to write that the copies of drawings "taken from Mr. Salt's drawings, have never, I believe, been published. I have pleasure in making known the successful results of Mr. Caviglia's labours, which I am enabled to do by the kindness of the Earl of Mountnorris, and I beg leave publicly to express my acknowledgements to his lordship" (Vyse and Perring, 1842, 107–10).

In 1842 the Prussian archaeologist Richard Lepsius organized an expedition to Egypt and had the opportunity to make a drawing of the Dream Stela on location at the Great Sphinx. Lepsius also made a paper cast, known in archaeology as a "squeeze" (Lepsius 1849, plate 68).[†15]

Lepsius had found the Dream Stela covered up, as Salt presumably had left it back in 1818, so he had to excavate around it to expose it. It may have been during this exercise or when he made the cast that the telling cartouche on line 13 was eradicated. This is hinted in Lepsius's report: "The Great Sphinx [was] almost half-buried in sand, and the granite stela [Dream Stela] of eleven feet between his paws, forming alone the back wall of a small temple erected here, was altogether concealed. For the immense excavations undertaken by Caviglia in 1818, have long since tracelessly [*sic*] disappeared. . . . By the labor of some sixty to eighty men for several days, we arrived almost at the base of the stela, which I immediately sketched, pressed in paper and a cast, in order to erect it at Berlin" (Lepsius 2010, 36, 48–49).

What Really Happened to Salt's Drawing of the Dream Stela

In early June 2001 I contacted Richard Parkinson, D.Phil., then assistant keeper of the Department of Egyptian Antiquities at the British Museum, to inquire about Salt's drawing of the Dream Stela. Parkinson is a leading expert on hieroglyphics and the works of Thomas Young. I asked Parkinson if I could have a copy of Salt's original drawing or, at least, be allowed to examine it. Although Parkinson confirmed to me that the British Museum had Salt's manuscript and drawings, unfortunately these were in the process of being moved to the new British Library on Euston Road and thus would not be available for consultation for some time. Not discouraged, I then contacted Jaromir Málek, Ph.D., of the University of Oxford's Griffith Institute. Málek is a leading expert on the Giza texts and monuments. Málek told me that he had done some work on the inscriptions of the Dream Stela and had a facsimile of Salt's drawing. Málek then telefaxed me the part showing line 13.

It seems that Patricia Usick, the honorary archivist of the Egyptian and Sudan Department at the British Museum, was unaware of the whereabouts of Salt's documents, because a year later, in 2002, she announced that these had been rediscovered at the British Museum! She wrote, "In 2002 a two-volume manuscript memoir on the Pyramids and Sphinx, by Henry Salt, was *rediscovered* in the archives of the Department of Ancient Egypt and Sudan, at the British Museum. *It was then studied in depth for the first time*. . . . The Atlas volume contains 66 original drawings by Salt. . . . Salt also made accurate and important early copies of hieroglyphic and Greek inscriptions found during the Sphinx excavations" (Usick and Manley 2007; italics added).

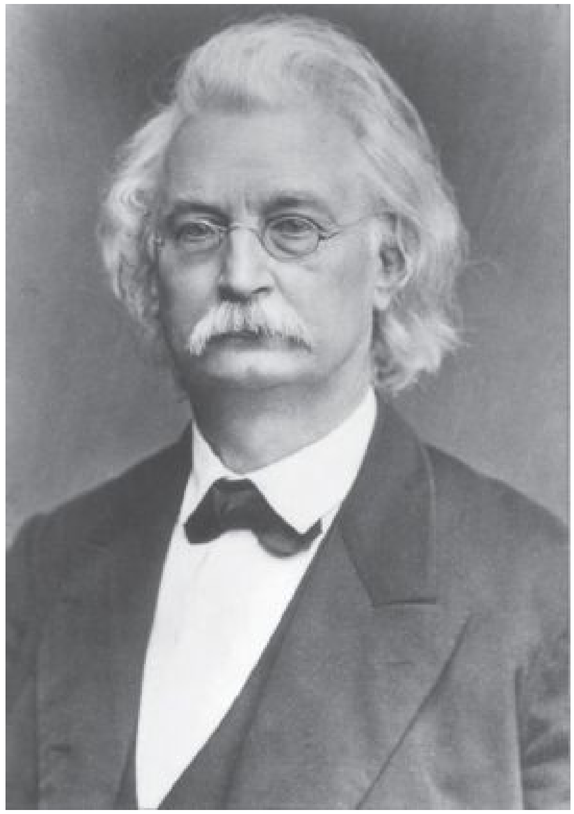
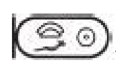


Fig. 3.7. Carl Richard Lepsius

We have added a full translation of the Dream Stela in appendix 5. Here we will only focus on line 13, which is said to have contained the broken cartouche of Khafre.

A quick glance at the various drawings made first by Salt (1817), then by Young (1823), then by Vyse (1838), and finally by Lepsius (1842) shows that there is confusion regarding line 13. For example, on the left part of line 13 Lepsius added a falcon with a sun disc on the head (usually a symbol of Horakhti, or Horus of the Horizon), which is *not* on Salt's drawing. As for Young, *he does not show the left part of line 13 at all . . . and thus no cartouche!*

An undamaged cartouche with Khafre's name should look like this: , which, it will be agreed, should allow us to deduce how it should have looked in line 13 of the Dream Stela before it totally disappeared.

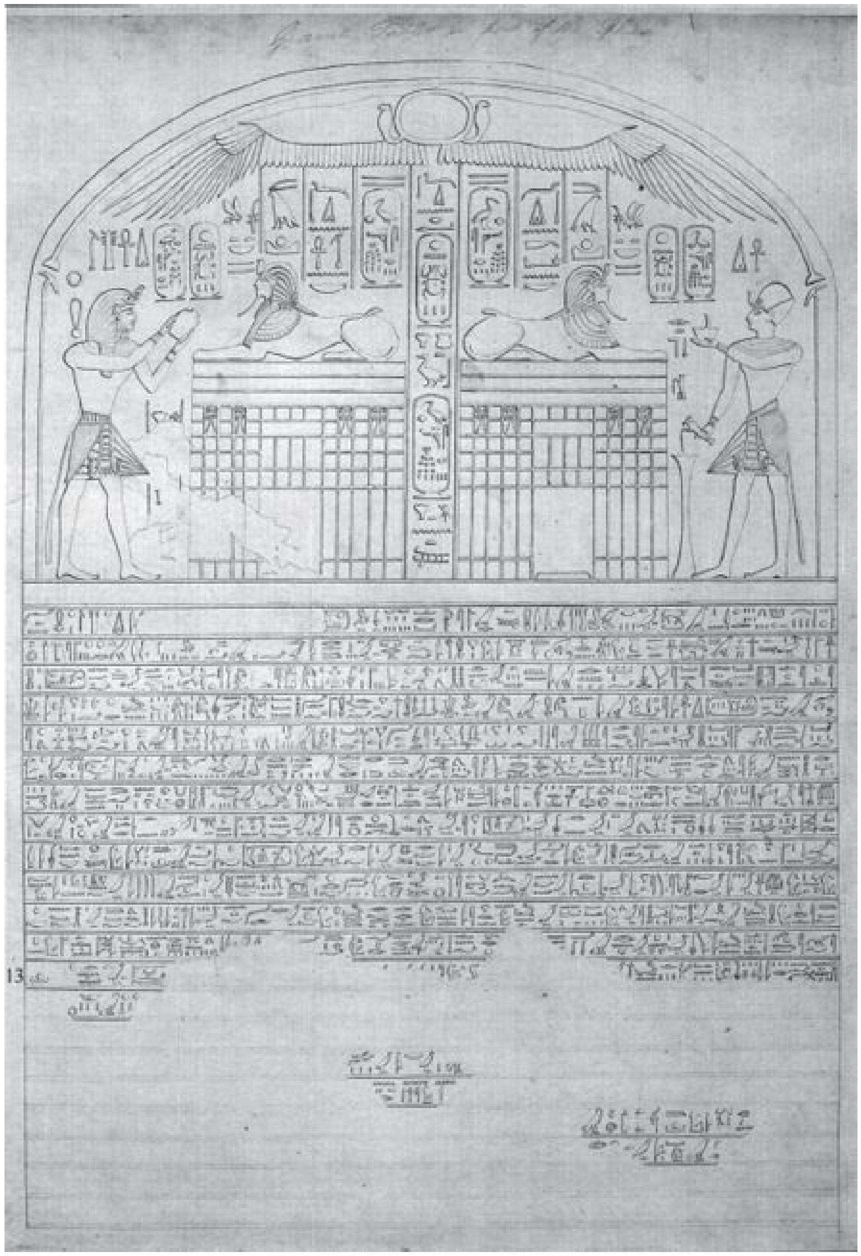


Fig. 3.8. Henry Salt's drawing of the Dream Stela, 1817.

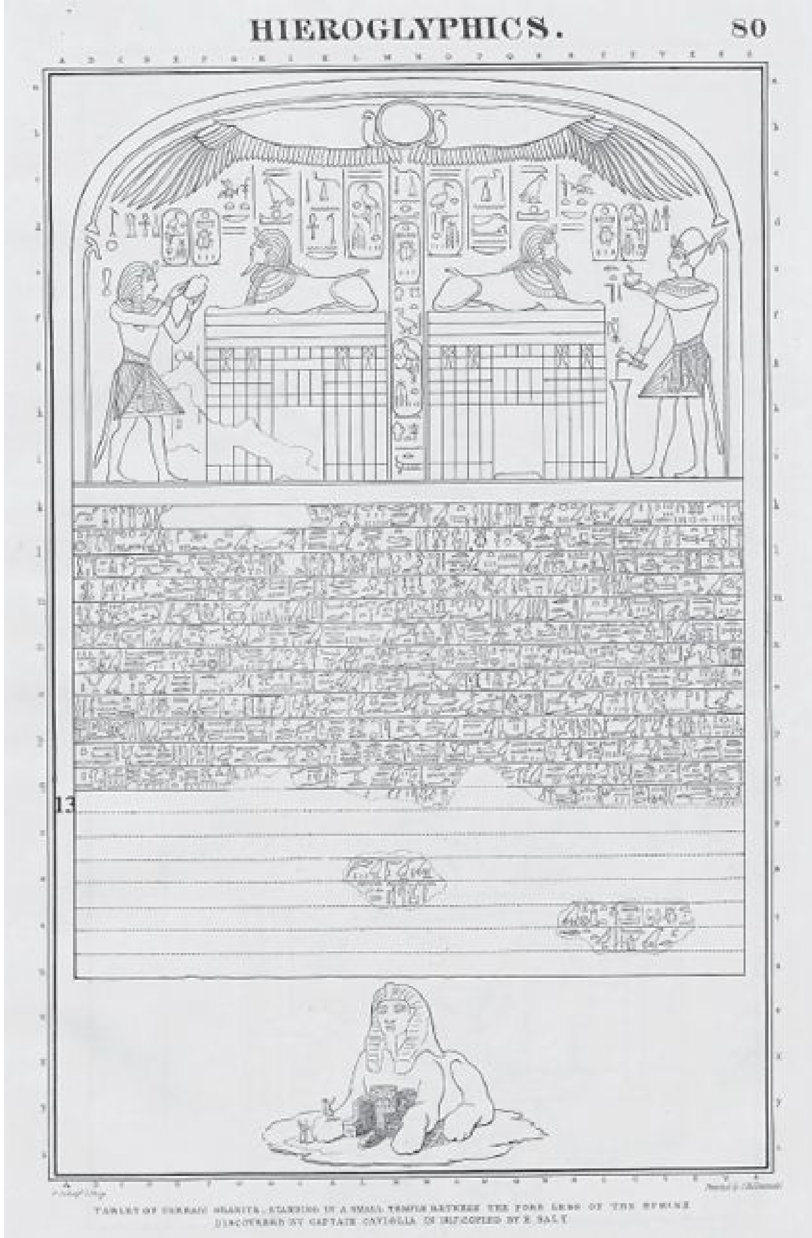


Fig. 3.9. Thomas Young's drawing of the Dream Stela, 1823, copied from Henry Salt's original.

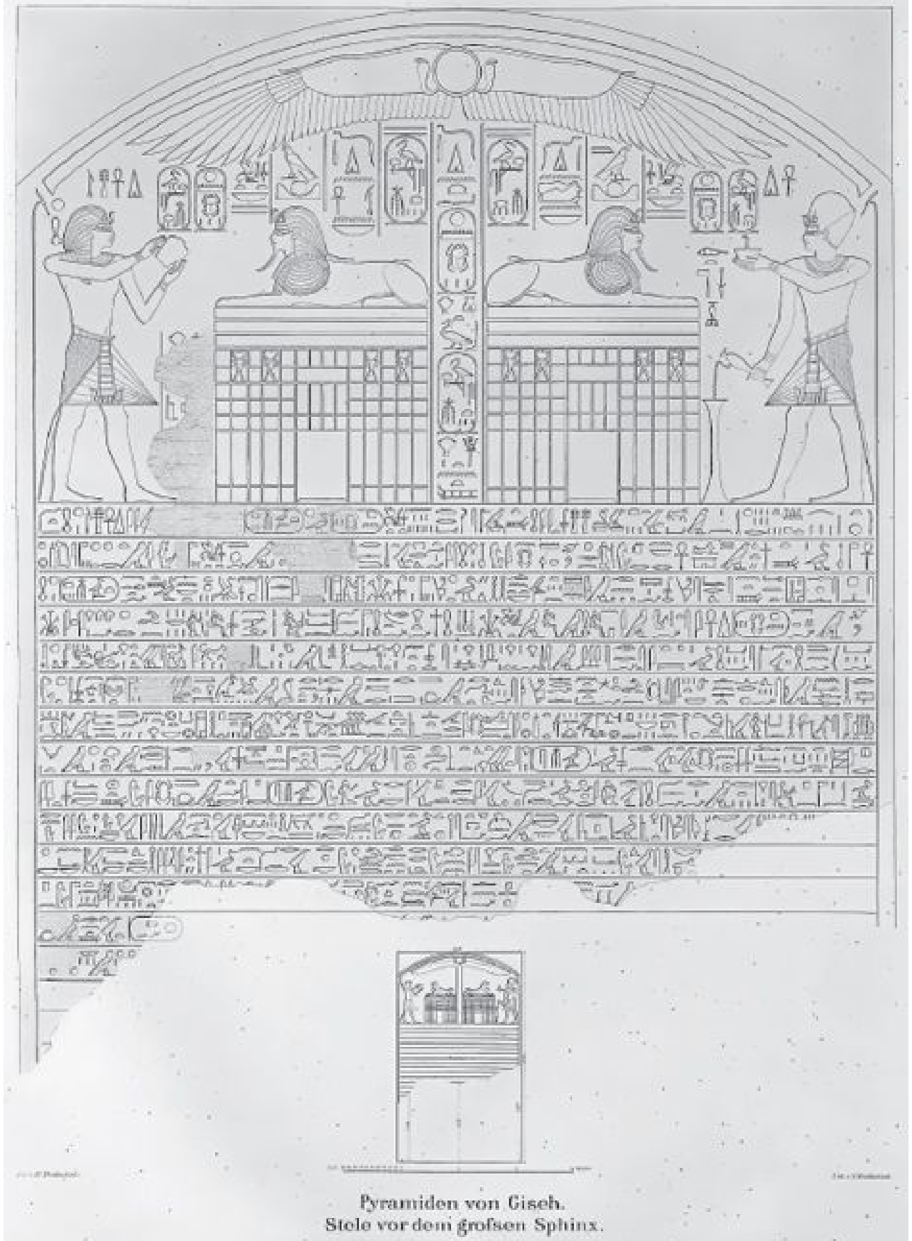


Fig. 3.10. Drawing from Carl Richard Lepsius (1842) of the Dream Stela. For Richard William Howard Vyse's drawing of the Dream Stela, copied from Henry Salt's original, see Fig. 2.8.

Is There a Photograph of Line 13 that Shows the Broken Cartouche?

The first photograph of the Great Sphinx was by Maxime Du Camp in 1849. At that time the Dream Stela was covered in sand. A British traveler, Francis Frith, took a photograph in 1858 showing the Sphinx covered up to its shoulders in sand. In 1853 and in 1858 Mariette cleared the Dream Stela, but I have not been able to locate any photographs by him that show details of the stela. There is also a photograph of the Sphinx dated 1867, which belonged to Lady Sophia Schilizzi, also showing the Sphinx covered to its shoulders (see figure 3.11). This photograph was probably originally owned by Lady Waldegrave, Lady Schilizzi's mother, and shot on location on her behalf by the humorist-writer Edward Lear during his travels in Egypt in 1867.

In 1884–1886 Gaston Maspero again cleared the Sphinx to expose the Dream Stela, but no photographs are available showing the Dream Stela as far as I know. The Great Sphinx was finally fully cleared of sand by Émile Baraize during his 1925–36 excavations (see figure 3.12), and I understand that he took more than two hundred photographs of his excavations, although they were never published but stored at the French Archaeological Institute in Cairo. I have not been able to consult them, although I suspect the broken cartouche on line 13 had already been erased. I did, however, find a photograph published by Émile Drition in 1939, which has line 13, but the cartouche cannot be seen (see figure 3.13).

Hassan excavated the Sphinx area from 1936 to 1938 and took many photographs, including one of the Dream Stela, which he published in 1953. His photographs show that the whole of line 13 is missing.

It would seem that we can only rely on the accuracy of Lepsius's drawing, since it was presumably made from the squeeze cast he did on location. I have not personally seen the cast, so I cannot be sure of this. But the American James Henry Breasted, who translated the inscriptions of the Dream Stela in 1906, seems to have consulted Lepsius's squeeze and decided to use it as the basis of his translation.[*16] Breasted felt that Vyse's copy was unreliable, but did use part of Young's copy, which was based on Salt's copy (Breasted 1906, vol. II, 320).

Fig. 3.11. The Great Sphinx with the body covered in sand circa 1867.

Fig. 3.12. The Great Sphinx during the excavations by Émile Baraize, 1925–1936.

Fig. 3.13. The left parts of Lines 12 and 13 are still barely visible, but the Khafre cartouche is missing. (Photograph published by Émile Drition, 1939.)

In his memoirs Lepsius remarked that the broken cartouche was *only just visible* when he examined the Dream Stela in 1842: “In an *almost destroyed line* of the Tuthmoses stela [line 13], king Chephren is named; *a portion of his royal cartouche,* unfortunately quite single, is yet preserved” (Lepsius 2010, 49; italics added). At any rate, if we settle on Lepsius’s drawing as being accurate, the translation of line 13 reads as follows:

> ____________ which we bring for him oxen . . . and all young vegetables; and we shall give praise [to] Wenofer ____________ Khaf [re] the statue made for Atum-Horemakhet.

It was the British Egyptologist Samuel Birch (1813–1885), who decided to add the phonetic sign *re* (a solar disc) in the broken cartouche to complete, as he imagined it, the name of Khaf[re]. Birch was probably using Vyse’s copy, and it is evident that Birch had some reservations as to what was meant by the wording on line 13: “*The remaining thirteen lines can scarcely be made out* . . . on the 13th line is part of a cartouche, which is apparently the prenomen of king Ra-shaa-f, or Shafre, supposed to be Chefren [Khafre]; but the fracture in the inscription makes it impossible to determine in what manner the name is mentioned” (Vyse 1842, vol. III, 115; italics added).

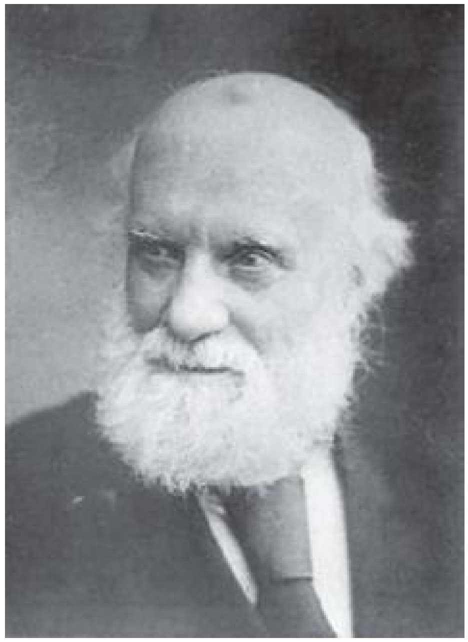


Fig. 3.14. Samuel Birch.

Nevertheless, because the Great Sphinx stood in an east-west alignment with the Second Pyramid, believed to belong to Khafre, Birch suggested that the cartouche did imply, if not prove, that the Sphinx was sculpted during the reign of this king. Not everyone agreed. Breasted strongly objected to this conclusion: “The mention of King Khafre has been understood to indicate that the Sphinx was the work of this king—a conclusion which does not follow” (Breasted 1906, vol. II, 324).

According to Breasted there were also many errors and irregularities in the text of the Dream Stela, implying it was probably a “restoration” made at a later period: “The form and content of the document are strikingly unlike the official or royal records of the pharaohs. It is, besides, filled with errors and striking irregularities in orthography, and exhibits a number of suspicious peculiarities not to be expected in a monument of this class. *It is therefore to be regarded as a late restoration, and it is a great question to what extent it reproduces the content of the monument of which it is a restoration*” (Breasted 1906, vol. II, 320–21; italics added).

Erman agreed with Breasted and even suggested that the Dream Stela should be dated to the Twenty-first or Twenty-second Dynasty, that is some four hundred years *after* Tuthmoses IV and nearly 1,500 years after the Fourth Dynasty! Today, however, Egyptologists generally agreed that the Dream Stela is the work of Tuthmoses IV, but not everyone agrees on the interpretation of line 13. The most recent objection is from Stadelmann, who argued line 13 does not prove at all that Tuthmoses IV believed Khafre created the Sphinx. Basing himself on iconographic evidence, Stadelmann is convinced that the Sphinx was not the work of Khafre but that of his father, Khufu, builder of the Great Pyramid (Stadelmann 2000, 464). To complicate things even further, the French-Polish Egyptologist Vassil Dobrev proposed that the Sphinx was the work not of Khafre or Khufu but of Djedefre, the elder brother of Khafre, but that the face of the Sphinx was made in the likeness of Khufu! (Fleming 2004).

Fig. 3.15. James Henry Breasted, 1928.

Fig. 3.16. Adolf Erman, 1929.

Frankly such quibbling among these Egyptologists is merely keeping the Sphinx, so to speak, in the same family (i.e., in the Fourth Dynasty) and does not really alter things much from a chronological viewpoint. Yet the intense rivalry between these scholars was felt at the Eighth International Congress of Egyptology in Cairo in 2000, when attendees witnessed an amazing display of academic enmity between Hawass and Stadelmann. Apparently, during Stadelmann's talk, when he was expounding his views on the Sphinx being Khufu's work, Hawass "rushed up from the audience onto the podium to say into the microphone that he differed from Stadelmann! He then proceeded to give a mini-lecture of his own while the hapless Stadelmann stood beside him, pointing out that . . . Stadelmann was hopelessly wrong" (Temple 2009, 45–46).

NOT THE FOURTH DYNASTY?

During excavations undertaken in 1936 Hassan discovered a large limestone stela immediately north of the Sphinx that belonged to Amenhotep II, the father of Tuthmoses IV. Hassan called it the "Great Limestone Stela." Interestingly, on this stela *both Khufu and Khafre* are mentioned in a context that suggests that the Great Sphinx was created *before* their time!

> [Amenhotep II] yoked the horses in Memphis when he was still young, and stopped at the Sanctuary of Horemakhet. He spent a time there in going round it (in the chariot) looking at the beauty of the Sanctuary [pyramids] of Khufu and Khafra the Revered. His heart longed to keep alive their name, and he put it into his heart. . . . Then [later when he became king] His Majesty remembered the place where he had rejoiced himself in the neighborhood of the pyramids of Horemakhet, and it was ordered to erect a Sanctuary there, and to erect in it a stela of limestone on which is inscribed his great name. (Hassan 1953, 76–77)

According to Hassan, "On his Great Limestone Stela, Amenhotep II refers to the 'Pyramids of Horemakhet,' a name which perhaps shows that he considered the Sphinx to be older than the Pyramids" (Hassan 1953, 12). Hassan also pointed out that Amenhotep II and his son/ successor Tuthmoses IV had reigned a thousand years after Khafre and Khufu, and cautioned that "we are building our hypothesis on New Kingdom texts which were written at a time when the Egyptians themselves had probably forgotten the original traditions of the God [Sphinx] . . . it is more than probable that neither Thothmes IV nor the priesthood attached to the Sphinx (if, indeed it had a priesthood at that time), knew the truth of the origin of the statue" (Hassan 1953, 12).

Stadelmann took the same position as Hassan and finally was compelled to conclude that "as there is no clear philological ascertainment for the creator of the Great Sphinx, we have to look for archaeological ones" (Stadelmann 2000, 465; Hassan 1953, 152).

We agree with Hassan and Stadelmann on this matter. Neither the inscription on the Great Limestone Stela of Amenhotep II nor that on the Dream Stela of his son, Tuthmoses IV, can be used as "proof" that the Sphinx was created by a Fourth-Dynasty pharaoh. Indeed, if we are to go by the inscriptions, then we should conclude that the Sphinx was already in existence long before the Fourth Dynasty! For there is, in fact, a "clear philological ascertainment" on the Dream Stela itself that tells us in no uncertain terms *that the Sphinx had been in existence since the remote "first time," that is, zep tepi—a time that in the mind of the ancient Egyptians harked back to a very distant epoch when the "gods" ruled Egypt.* Egyptologists, however, are quick to brush this aside as a "mythical" epoch that only existed in the imagination of the ancient priests. But what if it were true? What if *zep tepi was an actual historical epoch that can also be dated?* In chapters 6 and 7 we will show how, in fact, this has actually been done using the hard sciences of astronomy and geology. Meanwhile, let us see how the knowledge of zep tepi could have been passed down for posterity in temple archives or, to put it in a more poetic manner, in giant "books in stone."

THE EDFU TEMPLE TEXTS

There are inscriptions on the walls of the great Temple of Horus at Edfu that may indeed be historical and, furthermore, may be narrating events that took place in zep tepi, albeit couched in the typical mythoreligious style that was common to the ancient priests.

The temple we see today dates from the Ptolemaic epoch (ca. 280 BCE), but it is known, however, that it was built over much older foundations or hallowed ground believed to hark back to the “time of the first occasion” (i.e., zep tepi). The volume of inscriptions carved on the walls of the Edfu temple is staggering. The impression one gets is that the temple itself is a sort of giant book in stone, a sort of open-air “hall of record.” So prolific are these inscriptions that it took several decades for Egyptologists to copy them and a few more decades to actually translate them. The Edfu Texts, inter alia, speak of “mounds” in the Memphite region (which probably contain the various pyramid fields) that were considered sacred in the time of zep tepi and, more intriguingly, that on these mounds the “first temples” were built from plans supposedly brought down “from the sky.” As we have said, Egyptologists regard the inscriptions as expounding a “mythical history,” but what if they are wrong? What if the Edfu Texts are historical records? Is there evidence that supports this view?

Eve A. E. Reymond, Ph.D., of Manchester University studied the Edfu Texts for many years and published her thesis in a tome titled *The Mythical Origin of the Egyptian Temple.* Reymond fluctuated between what she termed the “mythical temple of Edfu” and the “historical temple of Edfu,” implying that she was unsure whether the events described in the Edfu Texts were mythical history or real history: “We are of the opinion that the Edfu temple records *preserve the memory of a predynastic reli-gious center which once existed near to Memphis,* on which the Egyptians looked as on [*sic*] the *homeland* of the Egyptian temple. [But it] must be admitted that there is no scrap of archeological evidence that such temples ever existed in Memphis” (Reymond 1969, 263; italics added).

I believe that the reason there is no archaeological evidence of pre-dynastic or protodynastic “temples” in the Memphite region is simply because these were not temples as such but *natural* temple mounds and knolls considered sacred, on which eventually were built pyramids (i.e., those “first temples” referred to in the Edfu Texts). Ironically, Reymond provides the evidence of the source of the knowledge of the original “mounds” preserved in the Edfu Texts.

> We incline to the opinion that the sacred book, the *Specification of the Sacred Mounds of the Early Primeval Age*, records the successive phase of evolution of sacred places and temples in one single region which can reasonably be regarded as *the homeland of the Egyptian temple*. Our study has furnished convincing evidence that this sacred book was based to a considerable extent, if not exclusively, on Memphite religious beliefs. It has every appearance of disclosing the history of sacred domains that were founded in the Memphite region during pre- and proto-dynastic times. . . . For the Egyptians the Memphite sacred domains were apparently of a mythical nature. (Reymond 1969, 267)

Reymond also states:

> It seems inherently probable that this rich repertory of various documents primarily formed parts of a single book that was called *ssr i3wt p3wt tpt, Specification of the Mounds of the Early Primeval Age*. Although this book is mentioned only in the Edfu inscriptions, there are good reasons for supposing that this book was of general application, and not a special work with restricted reference to the Edfu temple . . . It can tentatively be suggested that in this context the expression *ssr i3wt p3wt tpt*, *Specification of the Mounds of the Early Primeval Age*, might have been used as a general name of the prehistoric cultus-places[*17] of Egypt. (Reymond 1969, 8–9)

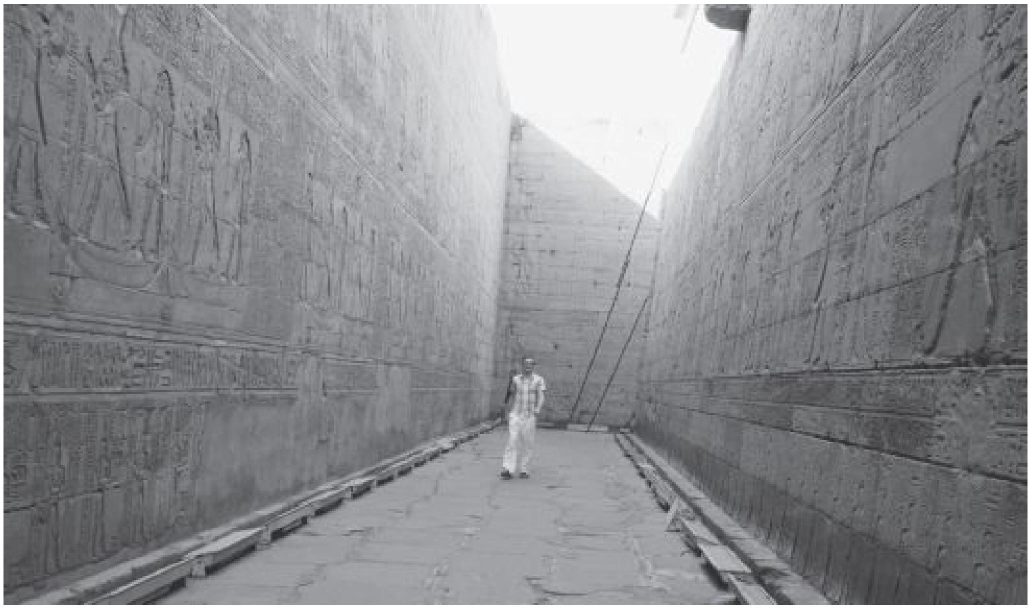


Fig. 3.17. The inscribed walls of the Edfu temple.
(Photo courtesy of R. Bauval.)

There is an annoying tendency by Egyptologists to consider some ancient texts as "mythical" if they do not fit their paradigm, while embracing others as "historical" if they do. Take for example the so-called king's list carved on the west and east walls of a long corridor in the temple of Seti I at Abydos (ca. 1300 BCE). On the west wall is a long horizontal line of royal cartouches giving the names of kings from the First Dynasty up to the Nineteenth Dynasty, covering some two thousand years of pharaonic succession. This list is accepted as historical by Egyptologists. However, on the east wall of the corridor is also a long list of cartouches going back into prehistoric times, which is rejected as "mythical" or "fictional" history by Egyptologists. This type of selectivity is also applied to the chronology and historical records compiled by Manetho, a high priest of Heliopolis, where parts of the records are accepted as historical while the parts that speak of a prehistoric era ruled by "gods and demi-gods" (called elsewhere the Shemsu Hor, or "Followers of Horus") is promptly rejected as "mythical."

The same treatment, too, is applied to the so-called Turin Papyrus, in which is mentioned the existence of the Followers of Horus before dynastic times. In the Turin Papyrus the Followers of Horus are also called *akhu,* which is normally translated as "venerable" but could also mean the "transfigured beings" or the "shining ones." According to Egyptologist E. A. Wallis Budge being an akhu also meant "to be bright," "to be excellent," "to be wise," and to be "instructed." Could the Followers of Horus be real ancestors who were remembered and venerated as transfigured beings, that is, as ancient rulers or kings deemed to have gone to an afterlife world?

We do not wish to embark on a complex discussion on Egyptian chronology, for this is a topic of Egyptology fraught with contradictions, pitfalls, and much confusion. The only point we wish to make here is that there is enough good reason to accept that the ancient Egyptians kept records that may have started in what Egyptologists refer to as "prehistory." The concept of prehistory is a modern one, giving the erroneous impression that nothing or little is known of what happened in the land of Egypt. But although this may be so for Egyptologists, there is no reason why the ancient Egyptians themselves did not know of what happened in their own land thousands of years before the First Dynasty and perhaps, who is to tell, even the very source of their own civilization. Paul Jordan pointed out, "The pharaohs who followed Tuthmoses IV went on favoring the site of the Sphinx, which was called *setepet,* the 'select,' the 'sacred place of the first time' as the Dream Stela puts it" (Jordan 1998, 197). And even though Jordan does not see any significance in this, he, and all of his Egyptologist colleagues, has no explanation why Tuthmoses IV and his successors would make such a claim if there was no historical foundation to it.

THE DAUGHTER OF KHUFU

There is a stela known as the Inventory Stela or the “Stela of the Daughter of Khufu,” which has caused much ink to flow because it too suggests that *the Great Sphinx was created before the Fourth Dynasty.*

The Inventory Stela was discovered in 1858 by Auguste Mariette. Bluntly, the inscriptions on the Inventory Stela affirm that the Great Sphinx existed *before* the construction of the Giza pyramids. But as to be expected, Egyptologists unanimously reject it as either a fake or, at best, as having no historical value, and consequently its narrative should not be taken literally. Here is an abbreviation of the relevant passages in the text:

> Live Horus *Mezdw* [the “Horus name” of Khufu], the King of Upper and Lower Egypt, Khufu, given life. He found the House of Isis, Mistress of the Pyramid, beside the House of the Sphinx, on the north-west of the House of Osiris, Lord of Rostau, and he built his Pyramid beside the temple of this Goddess, and he built a pyramid for the King’s Daughter, Henutsen, beside this temple. . . . The Place of Hwrn-Hor-em-akhet [the Great Sphinx], is on the south of the House of Isis, Mistress of the Pyramid, and on the north of [the House] of Osiris, Lord of Rostau. The plans of the image of Hor-em-akhet were brought in order to bring to revision the sayings of the disposition of the Image of the Very Redoubtable. He restored the statue, all covered in painting, of the Guardian of the Atmosphere, which guides the winds with his gaze. He made to quarry the hind part of the nemes, which was lacking. . . . The figure of this god, being cut in stone is solid and will exist for eternity, always having its face gazing toward the East. (Breasted 1906, vol. I, 85; Hassan 1953, 113–14)

The Inventory Stela was found in a small temple dedicated the goddess Isis. Egyptologists date the temple to the Twenty-first Dynasty (1070–945 BCE), but believe it was restored in the Twenty-sixth Dynasty (664–525 BCE). Thus, the stela is believed to be from this same epoch, sometime referred as the Saitic period. However, Mariette, although acknowledging that the dating of the stela is debatable, nonetheless was adamant that the *narrative* must be accepted as historical: “We can argue about the epoch of the carving of these texts . . . but we cannot argue about the content of the information given in the text . . . we also note that the Great Sphinx is shown among the other statues that are mentioned. This colossal symbol [the Sphinx] thus already existed in the time of Cheops [Khufu]. Consequently it is older than the actual pyramids” (Mariette 1872, planche 27).

Fig. 3.18. The Inventory Stela in the Cairo Museum.

Fig. 3.19. The Temple of Isis on the Giza Plateau, where the Inventory Stela was found. (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 3.20. Auguste Mariette, 1821–1881.

Fig. 3.21. Gaston Maspero, 1846–1916.

Maspero, the successor of Mariette, then suggested a compromise. According to him, the Inventory Stela was perhaps a copy of an older document: "The temple of Isis was rebuilt where it was found during the Twenty-first Dynasty by the Tanite King, Pasebekhanu, and the stela must have been made or restored under this King or perhaps under one of the Ethiopian Pharaohs. If it is a copy of a decayed monument, it probably preserves the arrangement of the original" (Hassan 1953, 117).

But Breasted began to shed doubt on the content of the Inventory Stela.

> The references to the Sphinx, and the so-called temple beside it in the time of Khufu, have made this monument from the first an object of great interest. These references would be of the highest importance if the monument were contemporaneous with Khufu; but the orthographic evidences of its late date are entirely conclusive, and the reference to the temple of a goddess whose cult arose as late as that of Isis, as well as the title of Isis viz, "*mistress of the pyramid*" prove conclusively that the present stela is not a copy of an older document. The fact that the priests of Pesebkhenno's time regarded the building beside the Sphinx as the temple of "Osiris of Rosta[u]" . . . is however, of great interest, but does not determine for us the original character of that structure. (Breasted 1906, vol. I, 83–84)

Today all Egyptologists without exception are of the opinion that the content of the Inventory Stela cannot be considered as evidence for an older Sphinx. The consensus is that the ancient scribe who created the stela in the Twenty-sixth Dynasty made up the whole story in order to allocate a greater, but false, antiquity to the "Temple of Isis."

> The 26th Dynasty saw an attempt to resurrect the glory of the Old Kingdom. At Giza there was an active priesthood of the Sphinx as *Horemakhet* and there were people calling themselves priests of Khufu, Khafre and Menkaure. Ironically, the worship of the powerful kings of Egypt who built the largest structures in Egypt was now carried out in the tiny Temple of Isis, built amongst the southernmost of the pyramids of Khufu's queens in the 21st Dynasty. A small stela there related another story about Khufu, namely that having found the Isis Temple in ruins he restored the images of the gods, and repaired the headdress of the Sphinx. The style of the text and the deities mentioned all point to its having been written in the 26th Dynasty; the story was no doubt told to give greater antiquity and authenticity to the fledgling cult. But its erroneous implication that the Sphinx and the Isis Temple predate Khufu shows just how far the perceived history of the site was slipping from fact. (Lehner 1997, 38)

The above comments were made in 1997 by Mark Lehner, who, most ironically, was once an ardent believer that the Great Sphinx of Giza was the work of "Atlanteans" who settled in Egypt in 10,500 BCE! Lehner, after joining forces with Hawass, repudiated such beliefs and joined ranks with Hawass and other Egyptologists that the Sphinx belongs to Khafre (Lehner 1974). In 1998, Jordan, a supporter and defender of Lehner, went as far as claiming that "the Inventory Stela is an anachronistic invention, a *pious fraud*" (Jordan 1998, 96; italics added).

We do not doubt that the Inventory Stela is indeed the work of the Twenty-sixth Dynasty priests or that the Temple of Isis dates from the Twenty-first Dynasty. But we definitely do not think it is a "pious fraud." Jordan is expressing the unconscious malaise in Egyptology that, ironically, was hinted at by the admission that Hawass made at the Sixth International Congress of Egyptology in Italy, namely that "if this statement [in the Inventory Stela] were true, it would mean that the Sphinx was carved before the reign of Khufu," which, to put it more bluntly, would then mean that Egyptologists were wrong about the age and identity of the Sphinx (Hawass 1993, 180–81). Be that as it may, let us take a closer look at the Inventory Stela by placing it in the context of its time and decide for ourselves whether its contents are historical or not.

THE ARCHIVES OF HELIOPOLIS

The Twenty-sixth Dynasty preceded the Persian invasion of Egypt by Cambyses. Its most important ruler was Ahmose II, a native Egyptian general who had usurped the throne after the Egyptian army's terrible defeat by the Libyans. There is a legend reported by Pliny the Elder (first century) that Ahmose II, whom he called Amassis, was buried under the Great Sphinx or within its body (Vyse 1842, 114). Bearing this in mind, there do exist many large granite and basalt sarcophagi in deep shafts at Giza dated to the Saitic period, which could support this possibility. According to a 1935 newspaper story, "Near its entrance were found shafts leading to several small burial chambers which contained sarcophagi. Two of these sarcophagi are of huge size and are made of basalt stone" (*Illustrated London News*, April 6, 1935).

Also, in London's *Daily Telegraph*, from March 4, 1935: "The chambers are, according to Prof. Selim Hassan, the Egyptian excavator, of the Saitic period (about 600 BC). Also one of Ahmoses II's wives, Queen Nakhtubasterau, has a tomb at Giza, as well as one of his sons. It is almost certain that during Ahmoses II's reign the very ancient temple of Heliopolis was still functioning with its astronomer-priests, its scribes, and also with most of its archives and storerooms very likely still intact" (Dodson and Hilton 2004, 245).

Indeed, reference to such an archive is found in the Westcar Papyrus in Berlin, where a tantalizing hint is given that it also held the secret architectural plans of the Great Pyramid of Giza (Bauval and Gilbert 1994, 250–55). The relevant part in the Westcar Papyrus is a dialogue between the pharaoh Khufu and a magician called Djedi. The story starts with one of Khufu's sons, Prince Hordedef, informing his father that "there is a commoner called Djedi . . . he knows the number of chambers of the Sanctuary of Thoth. Now the majesty of the king of Upper and Lower Egypt Khufu, justified, spent the day [i.e. a long time] seeking for himself these chambers of the Sanctuary of Thoth in order to make something similar for himself, for his 'Horizon' [a synonym for a 'tomb' or a 'pyramid']."
Khufu commands Prince Hordedef to bring Djedi to the palace.

> Then king (Khufu) Cheops, justified, said [to Djedi]: "Now what is said is that you know the number of chambers of the Sanctuary of Thoth."
>
> And Djedi said: "I beg your pardon, I don't know the number thereof, sovereign my lord, but I know the place where it is kept."
>
> Then his Majesty said: "So where?"
>
> And this Djedi said: "There is a casket of flint in a room called *The Inventory* at Heliopolis, (well, it is) in this casket."
>
> Then his Majesty said: "Go bring it to me."
>
> And Djedi said: "Sovereign my Lord, look, I am not the one who will bring it to you."
>
> Then his Majesty said: "Who then will bring it to me?"
>
> And Djedi said: "The eldest of the three children who are in the womb of Ruddjedet will bring it to you."
>
> Then his Majesty said: "I want it."

The narrative goes on to describe the semimagical birth of the triplets of Ruddjedet, the wife of the high priest of Heliopolis. We are told that several goddesses attend the birth, including the quintessential goddess of Egypt, Isis. The goddesses inform us that the three infants of Ruddjedet will "perform this magisterial office in this entire land (become pharaohs), for they will build your temples." Isis then takes the leading role in the delivery and gives the three babies their names. These names are obvious variations of three pharaohs of the Fifth Dynasty: Usseref (Userkaf), Sahure, and Keku (Neferirkare). Their father's name is given as Reusre, the high priest of Heliopolis (Nederhof 2008, 36–41).

These pharaohs are known to have built pyramids at Abusir (Sahure and Neferirkare) and at Saqqara (Userkaf). They also built sun temples at Abusir. Recently, it has been suggested that these sun temples had been deliberately positioned in a place that had a clear view toward the great sun temple of Re-Horakhti at Heliopolis (Bauval 2010, 71–74). Although the Westcar Papyrus dates from the Middle

Kingdom (i.e., some nine hundred years after the reign of Khufu), Egyptologists readily accept its narrative as being semihistorical. Indeed, Hawass made full usage of the narrative in the Westcar Papyrus in December 2002 to argue that the "real burial chamber" of Khufu may be behind the small doors found at the end of shafts in the Great Pyramid: "I would like to suggest that these doors hide Khufu's real burial chamber. . . . About 900 years after the reign of Khufu we have a story called 'Khufu and the Magician.' It tells the story of how Khufu brought the magician Djedi to ask him about the secret documents of the god Thoth, the god of wisdom, so he could design his Pyramid. Djedi knew everything about the secret chambers of Thoth, but he did not reveal the secret. I therefore believe that the burial chambers were hidden behind these doors" (Hawass 2006).

In his detailed study of the Westcar Papyrus, the British Egyptologist Alan H. Gardiner convincingly argued that the terms *inventory room* or *revision room* in the Westcar Papyrus must denote an *archive* room at Heliopolis: "Insufficient weight is given to the name 'revision'/*sipty* given to the room in which the flint box (casket) is to be found. Now *sipty* is the regular word employed for 'taking stock' [inventory] of the property of a temple . . . for this reason, surely, the room in question must have been an archive" (Gardiner 1925).

Interestingly, on the Inventory Stela we also are told how Khufu requisitioned the "plans" from an archive so that he could undertake restoration and embellishment works on the Great Sphinx.

> The plans of the image of Horemakhet [the Great Sphinx] were brought [to Khufu] in order to bring to revision the sayings of the disposition of the Image of the Very Redoubtable [the Sphinx]. He restored the statue, all covered in painting, of the Guardian of the Atmosphere, which guides the winds with his gaze. He made to quarry the hind part of the nemes [royal headdress], which was lacking. . . . The figure of this god, being cut in stone is solid and will exist for eternity, always having its face gazing toward the East. (Hassan 1953, 113–14)

A more recent evaluation of the Inventory Stele was given by the French Egyptologist Christiane Zivie-Coche, who is regarded as an expert on Giza in the Late Period.

> The *archives of the temple of Harmakhis* [Horemakhet, the Sphinx] were consulted [by Khufu] for the purpose of repairing damaged parts of the colossus, which was apparently decorated with painted elements. Some scholars have suggested that the stone that was replaced might have corresponded to the back of the *nemes*, but the text is in too bad a condition for that to be certain. . . . Though many points in the text remain obscure, it appears that the cult of Haurun-Harmakhis [the Sphinx] continued to function according to established regulations, and that his temple possessed archives that were examined in order to repair his statue. (Zivie-Coche 2002, 89; italics added)

From a Translation of the Inventory Stela by Christiane Zivie-Coche

Note: Zivie-Coche uses the names Haurun and Harmakhis or a combination of both to refer to the Great Sphinx. She also uses the word house to mean "temple" and furthermore has taken the immense liberty of adding in parentheses the prefix re to the word *built* to imply a rebuilding by Cheops because, she unabashedly explains, “This misdating [of the stela] led to chronological aberrations, especially when ‘construct,’ rather than ‘reconstruct’ was understood. The temple of Isis would have been older than the Pyramids themselves!” But what Zivie-Coche really meant is that *she* decided that the word *construct* should be read as “reconstruct” so that the sense of the text fits the consensus in Egyptology that the Sphinx is not older than the pyramids! At any rate, here’s Zivie-Coche’s translation:

> Live the Horus Medjed, the King of Upper and Lower Egypt, Khufu, given life. He found the house of Isis, Mistress of the Pyramids, next to the house of Haurun, northwest of the house of Osiris, Lord of Rasetau. He (re)built his pyramid beside the temple of this goddess. He (re)built the pyramid of the king’s daughter Henutsen beside this temple. Live the Horus Medjed, the King of Upper and Lower Egypt, Khufu, given life. He made an inventory, carved on a stela, for his mother Isis, the mother of the god, Hathor, Mistress of the Sky. He restored for her the divine offerings and (re)built her temple in stone, that which he found in ruins being renewed, and the gods in their place.
>
> The temenos of Haurun-Harmakhis is south of the temple domain of Isis, Mistress of the Pyramids, and north of Osiris, Lord of Rasetau. The writings of the temple of Harmakhis were brought to make the inventory, were brought to make the inventory (bis) of this divine being (?) of the great [. . .] his effigy, its casing entirely covered with writings [. . .] he made [. . .] which is in gilded stone of seven cubits [. . .] in the temenos of Harmakhis, in conformity with this model that is carved [. . .]. He set up an offering table for the vases [. . .]. May he endure. May he live forever and ever, his face turned toward the East.

There is a series of obvious common denominators between the Inventory Stela and the Westcar Papyrus: both deal with the reign of Khufu, both refer to archives, both are about the construction or repairs of a major Giza monument, and both evoke the goddess Isis. Yet despite such glaring clues, Egyptologists prefer to ignore them since they are convinced, rightly or wrongly, that the Inventory Stela is, to use Jordan’s words, a “pious fraud.” On the question of the goddess Isis, Egyptologists also insist that there is no evidence that a cult of Isis existed in the Fourth Dynasty, at least not one of any importance such as implied by the Inventory Stela. In 1990, however, I published an article showing that the southern shaft of the Queen’s Chamber in the Great Pyramid of Khufu was directed to Sirius, a star well known to be associated with Isis or, to be more precise, with the “womb of Isis” from which emerged the newborn king, Horus (Bauval 1990, 21–25). This alone shows that Isis was of immense importance to the rebirth rituals of the builder of the greatest pyramid of all and, by extension, to the whole of the Fourth Dynasty! This hypothesis, furthermore, has been well received by most Egyptologists, including Miroslav Verner (Verner 2002, 200–2). This raises the question, Could the plans to design such a scheme in the Great Pyramid have been kept in the mysterious archive or “inventory room” referred to in the Westcar Papyrus?

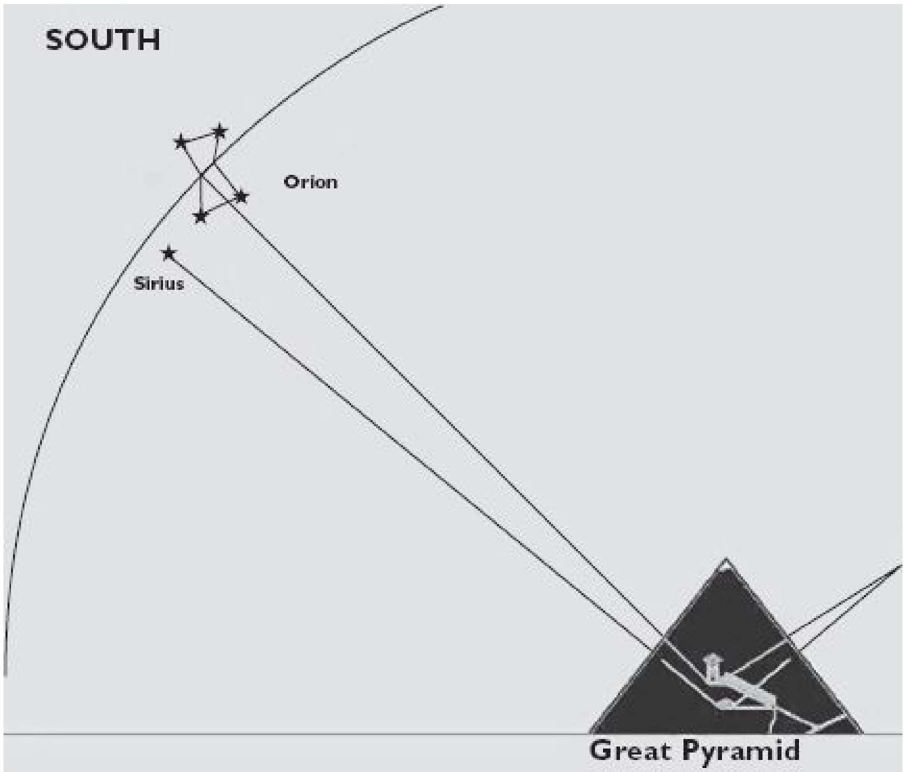


Fig. 3.22. The southern star shafts in the Great Pyramid. (Courtesy of R. Bauval.)

LORD OF ROSETAU

There is something else in the Inventory Stela that warrants closer scrutiny. The text several times makes reference to an important "temple" or "house" belonging to the god Osiris, "Lord of Rosetau." The location of this temple/house is given in relation to the Great Sphinx and the "Temple of Isis." Indeed, the ancient scribe-priest seems determined in ensuring that its location is well fixed from different perspectives:

> The Temple of Isis, Mistress of the Pyramids, is next to the sanctuary of the Sphinx and northwest of the House of Osiris, Lord of Rosetau.
>
> The sanctuary of the Sphinx is south of the Temple of Isis and north of the House of Osiris.

The location of the "Temple of Isis," the ruins of which still can be seen today, is thus known with certainty: it is immediately on the east side of the most southern small pyramid allocated to Henutsen, a wife or daughter of Khufu.[*18] We also know, of course, the location of the Great Sphinx. We should then be able work out from these two fixed positions where the "House of Osiris" was located. There is, indeed, a temple or house immediately south of the Sphinx and southeast of the Temple of Isis, as instructed in the Inventory Stela; this is the huge granite temple discovered by Mariette in 1858. Could this temple be the House of Osiris?

Fig. 3.23. View of the Giza necropolis looking north.
(Photo courtesy of R. Bauval.)

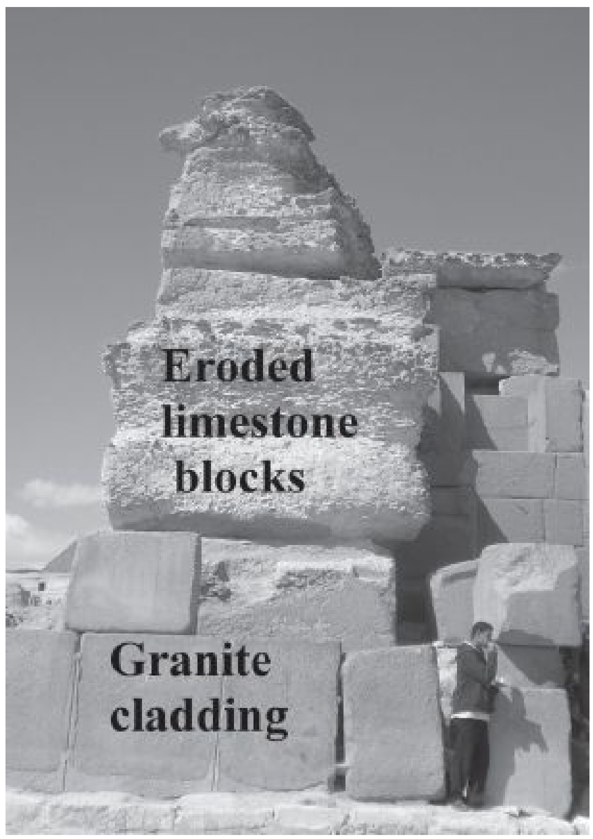


Fig. 3.24. The southeast corner of the Valley Temple of Khafre showing the remains of the cladding over the heavily eroded giant limestone blocks.
(Photo courtesy of Robert Bauval.)

We have seen how this granite temple, which Egyptologists call the Valley Temple of Khafre, contained inscriptions possibly with the name and titles of Khafre. This granite temple, however, is "boxed" by a limestone temple composed of giant blocks that were once covered with granite cladding. There are no inscriptions on the limestone temple blocks, which are also extremely eroded and unsightly. This suggests that this perhaps is why they were cladded with granite. The impression is that there is not one but *two temples, one covering the other like a Russian doll:* an older and larger limestone temple in which a smaller granite temple was later added, probably in the Fourth Dynasty by Khafre. Could the older limestone temple be the mysterious "House of Osiris"? Egyptologists would immediately answer that there is no evidence to support this claim except, of course, the text of the Inventory Stela, which they reject as invalid. At any rate, let us see where Egyptologists think the House of Osiris might have been.

SELIM HASSAN'S "TEMPLE" OR GEORGE ANDREW REISNER'S "TEMPLE"?

In 1949 Selim Hassan made a brief commentary of where, in his opinion, the House of Osiris mentioned in the Inventory Stela might be located: "In our ninth season's excavations we unearthed the remains of this temple [House of Osiris], and its position corresponds exactly with the disposition of the monuments as given in the text of this [Inventory] Stela" (Hassan 1953, 113).

Later, in 1960, Hassan gave more precise information: "Here [somewhere southeast of the Sphinx] there was a great mound of sand, partly composed of the dump of earlier excavations of Mariette and others in the aforementioned Valley Temple [of Khafre]. On investigating this, we found that it covered the very denuded remains of a large temple, which, from ancient documents, and particularly the information given on the so-called 'Inventory Stela' found by Mariette in the neighboring Temple of Isis I feel should be identified as the temple [House] of Osiris, 'Lord of Rostaw'" (Hassan 1960, iii).

In 2008 the French Egyptologist Stephane Pasquali undertook a study of Hassan's excavations around the area where the latter had suspected the "temple of Osiris, 'Lord of Rostaw'" was located. Pasquali noticed a mound or tumulus on a photograph taken between 1932 and 1938, which appears to have been excavated by George Andrew Reisner in 1937. It seems that Reisner also speculated that there was once a temple here, but that he concluded it belonged to a son of Rameses II, Prince Khaemwase, who dedicated it to the Great Sphinx. Pasquali, however, concluded that the temple found by Hassan, which today is unfortunately destroyed or covered in sand, was this Temple of Khaemwase suggested by Reisner. And since Prince Khaemwase was from the Nineteenth Dynasty, then the House of Osiris must also be from that same period and does not, therefore, predate the pyramid of Khufu, as implied in the Inventory Stela (Pasquali 2008, 75–78). But surely Reisner and, later, Pasquali are in the realm of speculation and clearly trying to somehow force the issue to fit the Egyptological consensus regarding the Inventory Stela.

OSIRIS AND ISIS IN THE PYRAMID AGE

It is well known that Osiris was the brother-husband of Isis. In the Pyramid Texts there is a "copulation" ritual between the departed king-Osiris and the goddess Isis, which takes place in the sky, and which uncannily fits the symbolic architectural features of the two southern star shafts in the Great Pyramid, which were directed to Orion's Belt (Osiris) and Sirius (perhaps the "womb" of Isis): "O Osiris the king, arise . . . your sister Isis [wife, queen] comes to you rejoicing for love of you. You have placed her on your phallus and your seed issues into her, she being ready as Spdt [the constellation Canis Major], and Horus-Spd [the star Sirius] has forth from you as Horus who is in Spdt" (Pyramid Texts, line 632).

This "astral" sexual act was surely imagined to take place inside the pyramid, in which the body of the Osiris-king has been placed. Bearing this in mind, there is also a passage in the Pyramid Texts that *actually personifies* the pyramid as the Osiris-king: "This king is Osiris, this Pyramid of the king is Osiris, this construction of his is Osiris" (Pyramid Texts, line 1657).

Does not all this more than imply, if not prove, that Osiris and Isis were of immense importance in the pyramid age? We will return to these questions in chapters 5 and 6. But for now let us close with the commentaries by the British Egyptologist David Rohl regarding the narratives of the various stelae found at Giza that we have considered in this chapter.

> It is clear from studying the remaining surviving fragment of the Thutmose IV Dream Stela, line 13, that the Lepsius copy is the most accurate (reflecting his use of a squeeze of the original inscription). Where Vyse has fragments of glyphs at the left end of line 13, Lepsius is able to restore the glyphs correctly (in my view) to read "Horemakhet" (i.e. the Sphinx). It is also clear that the reading of the cartouche should indeed be Kha-f-[Ra] as Lepsius has it. Of this there can be little doubt. The surviving remnants at the left end of line 13 should therefore read "[. . .] Khaf[re] the image made for Atum-Haremakhet." The long missing section of line 13 which precedes the cartouche of Khafre (to the right) is where the action undertaken by the king would have been described. So, given that this text is lost, there is absolutely no textual evidence on this stela to demonstrate that Khafre carved the Sphinx. Indeed, the way that the surviving inscription reads suggests strongly that Khafre's actions involved some [restoration or embellishment] work on an already pre-existing image of Atum-Horemakhet. Given the existence of an earlier stela standing before the Sphinx and carved for Thutmose's father, Amenhotep II, which has the cartouches of both Khufu and Khafre in the narrative text (the one following the other), it could be proposed that the Dream Stela followed the example of the immediately preceding Amenhotep II stela by including both king's names on line 13. Khufu's cartouche has then subsequently fallen away in the lacuna immediately to the right of Khafre's cartouche. In which case, the obvious conclusion to be drawn would be that neither king [Khufu or Khafre] carved the Sphinx but rather undertook repair work or a re-carving of elements of the image of Atum-Haremaket during the 4th Dynasty. This is consistent with the much later Inventory Stela which also claims that the Sphinx already existed at Giza prior to the construction of Khufu's pyramid. The reasonable inference to draw from all this is that the Sphinx predates the 4th Dynasty. (In personal correspondence)

Bearing in mind all this tantalizing but still inconclusive evidence, let us now take a closer look at the Sphinx, or rather his facial features, to see if these can tell us more about who or what the Sphinx really is.

Chapter Four

A CASE OF MISTAKEN IDENTITY?

Robert Bauval

Nobody knows its [the Sphinx's] original name. . . . There are hundreds of tombs at Giza with hieroglyphic inscriptions dating back some 4,500 years, but not one mentions the statue [Sphinx].

JAMES ALLEN, PH.D., EGYPTOLOGIST AT BROWN UNIVERSITY

There are no Old Kingdom texts that refer to the Sphinx.

AMY CALVERT, PH.D., EGYPTOLOGIST AT NEW YORK UNIVERSITY

THE FIRST TIME I SAW YOUR FACE

It is most revealing that Western travelers to Egypt in the fifteenth to the eighteenth centuries often describe the face of the Great Sphinx as being that of a "woman," a "girl," a "virgin," an "idol of Isis," or, even more intriguingly, as a beautiful maiden called "Rhodope."[*19]

The latter was apparently on account of the rosy color on the Sphinx's cheeks—the remnant of red ochre paint with which the statue was originally painted, which reminded travelers of Greek and Thracian courtesans with rosy cheeks. Rhodope in Greek means "rusty," but it was also the name of a legendary Thracian queen, the wife of Haemus, who was turned into a mountain by Zeus and whence the Rhodope mountain range in Bulgaria got its name. There is a novel from 1780 that tells the story of a beautiful slave called Rhodope who was the lover of the famous storyteller Aesop. The story goes on to tell how Rhodope and Aesop came to Egypt and how Rhodope eventually married the pharaoh.[*20]

Perhaps more interesting, however, are the comments of travelers who saw in the face of the Sphinx Ethiopian, African, and Negroid features, in other words, the face of a black-skinned individual and, even more intriguing, one usually said to be a woman. Take for example the account of the French nobleman Constantin-Francois Chasseboeuf, better known as Comte de Volney,[†21] who visited Cairo in 1783: "On seeing this head [of the Sphinx], typically Negroid is all its features, I remembered the remarkable passage where Herodotus says: 'As for me, I judge the Colchians to be a colony of the Egyptians because, like them, they are black with woolly hair'" (Chasseboeuf 1858, 131).

In the latter part of his travels Volney met the artist Louis-Francois Cassas, who had spent three months in Egypt in 1785 and had made a painting of the pyramids and the Sphinx. Volney bought the painting to put in the travelogue, which he published in 1787 (Volney 1787, 132). The painting is extremely well detailed, although Cassas clearly allowed himself artistic license by showing the Sphinx with a well-formed nose, even though it is well known that the nose had already been severely damaged long before. As for the "typically Negroid" features of the Sphinx's face, Volney made reference to the ethnicity of the ancient Egyptians.

> The ancient Egyptians were true Negroes of the type natural to Africa; and since then we can explain how their blood, mixed for many centuries with that of the Greeks and Romans, must have lost the intensity of their original [black] color, although they retained their original features . . . what a subject for reflection to see the barbarous and ignorance of the Copts [he means the people of modern Egypt], they being the product of the profound genius of the Egyptians and the brilliant mind of the Greeks; to think of this race of black men [the ancient Egyptians], today our slaves and the object of our scorn, and being the actual ones to which we owe our arts, our sciences and even the use of speech; to finally imagine that it is in the midst of those who claim to be the most friends of Liberty and Humanity, that we have sanctioned the most cruel form of slavery, is confounded if black men have an intelligence the same as that of the whites! (Volney 1787, 132)

Volney was convinced not only that the original Egyptians were black skinned but also that it was from them that the world had inherited "our arts, our sciences and even the use of speech." He clearly wanted to put to shame the *modern* Egyptians (he called them Copts), who denied this, and, more specifically, the "friends of Liberty and Humanity," that is, the French, for turning a blind eye to the slave trade, which was still practiced in Egypt in the eighteenth century and in many other parts of the Christian world.[*22]

It is often said, although wrongly, that the nose of the Sphinx was broken off by the cannons of Napoleon Bonaparte during his military campaign in Egypt in 1798–1801. But drawings made forty-one years earlier in 1757 by a Norwegian navigator and artist, Frederick Norden, clearly show that the nose was already broken. Today most scholars agree that this vandalism took place in the fourteenth century, when a fanatical Muslim-Sufi iconoclast called Sheikh Mohammad Sayem el Dahr hacked off the nose with a pickaxe (El Makrizi 1913, 157).

Fig. 4.1. View of the Head of the Sphinx. *Painting by Louis-Francois Cassas circa 1790.*

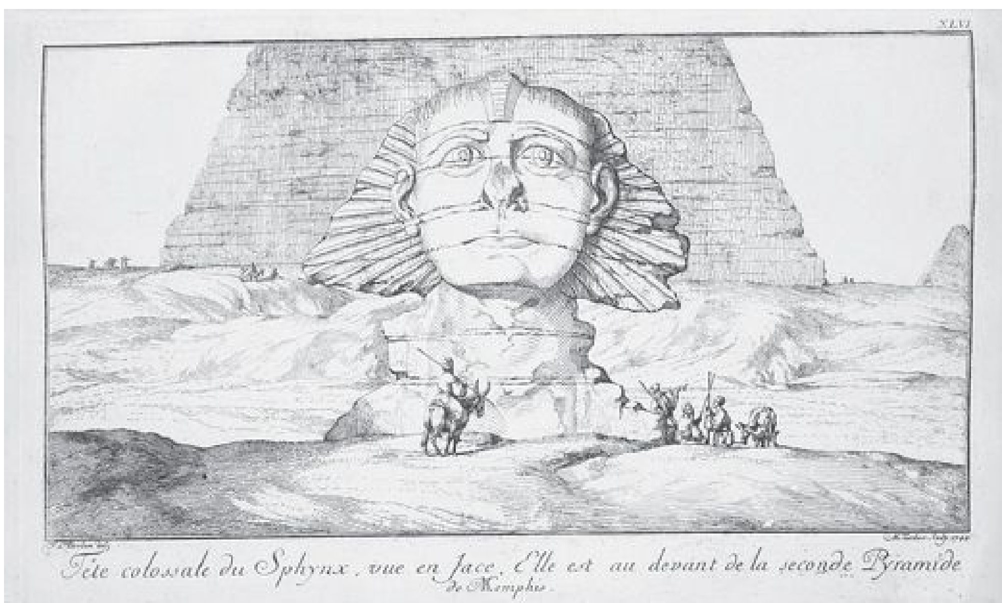


Fig. 4.2. The Sphinx drawn by Frederick Norden, 1757.

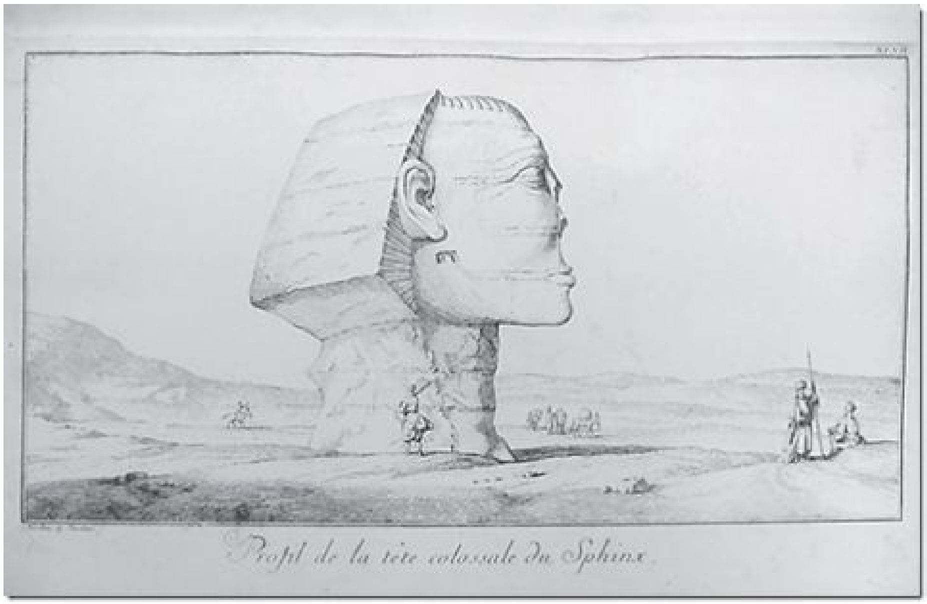


Fig. 4.3. The Sphinx drawn by Frederick Norden, 1757.

Yet even with its broken nose it cannot be denied that the face of the Sphinx does have strong Negroid features. There is, too, a description given by the artist Vivant Denon, who was in Egypt with Napoleon in 1798–1801. Denon was a member of the French Academy and later became the first director of the Louvre Museum. This is what he wrote about the Sphinx's face: "The outline [of the Sphinx's face] is pure and graceful; the expression of the face is mild, gracious and tranquil; the character is *African;* but the mouth, the lips of which are thick, has a softness and delicacy of execution truly admirable; it seems real life and flesh" (Denon 1803, 140; italics added).

Denon's drawing clearly shows the Negroid features that he described in his memoirs. But like Cassas, he clearly allows himself artistic license. More realistic drawings of the Sphinx were published in *Description de L'Egypte* in 1809–23, to which Denon was a consultant as well as a contributor.

Fig. 4.4. Drawing by Vivant Denon, from his memoirs, 1803.

Fig. 4.5. A view of the Sphinx looking north in Description de L'Egypte*, vol. V, planche 8. Note how this is the same scene shown by Denon from another perspective and closer.*

However, and notwithstanding artistic license or Afrocentric bias, it is true to say that many people even today perceive the face of the Sphinx as African or Negroid—and for good reason: the protruding lower jaw of the Sphinx, a feature known as prognathism or Habsburg jaw, is classified by anthropologists as typically sub-Saharan or Negroid.[*23]

Fig. 4.6. Drawing of the Sphinx in Description de L'Egypte*, vol. V, planche 11, 1822.*

We, too, perceive the face of the Sphinx as African-Negroid. And even though the face has suffered erosion and mutilation over the centuries, the cranial-facial features are still unchanged and very noticeably Negroid. In 2011, I was a guest speaker at the Second Nile Valley Conference in Atlanta and recall sitting next to a very lovely African-American woman whose profile bore a striking resemblance to that of the Great Sphinx. She had the same African-Negroid broad cheeks, full lips, and typical protruding jaw.[*24]

Fig. 4.7. Cranial-facial features of an African-American woman.
(Photo courtesy of R. Bauval.)

Another typical description of the Great Sphinx given by many early travelers to Egypt, as this one given by Frederik Norden, was that it had the “head of a virgin with the body of a lion, a symbol of what happens in this country when the sun is in the [zodiacal] signs of Leo and Virgo, and the Nile Overflows” (Norden 1757, 76). This “astrological” identity in connection with the Inundation of the Nile was almost certainly borrowed from the first-century Roman author Pliny the Elder, who wrote that “it [the Nile] is at its greatest height while the sun is passing through Leo, and it falls as slowly and gradually as it arose while he [the sun] is passing through the sign of Virgo” (Pliny, ch. 10). As we shall see in chapters 5 and 6, Pliny was not far from the truth, and he may have been reporting a very ancient tradition about the yearly Inundation of the Nile and the symbolism of the Great Sphinx of Giza.

PROFILING THE SPHINX

For decades now, Zahi Hawass and Mark Lehner have used the international media to convince the public that the face of the Great Sphinx is that of the pharaoh Khafre. But it all came—or should have come—to an abrupt end in 1993 with the airing of the NBC Emmy Award–winning documentary *The Mystery of the Sphinx*, presented by Charlton Heston and featuring John West and Robert Schoch. In this documentary the Sphinx = Khafre consensus was forcefully debunked by Detective Frank Domingo, a forensic scientist and profiler with the New York City Police Department. After carefully studying the face of the Sphinx on location as well as in dozens of photographs and diagrams, Domingo went on record to state, “After reviewing all the measurements, angles and proportions, it’s my conclusion that the Great Sphinx of Giza is *not* the same individual represented in the statue of Chephren [Khafre]” (NBC 1993; italics added).

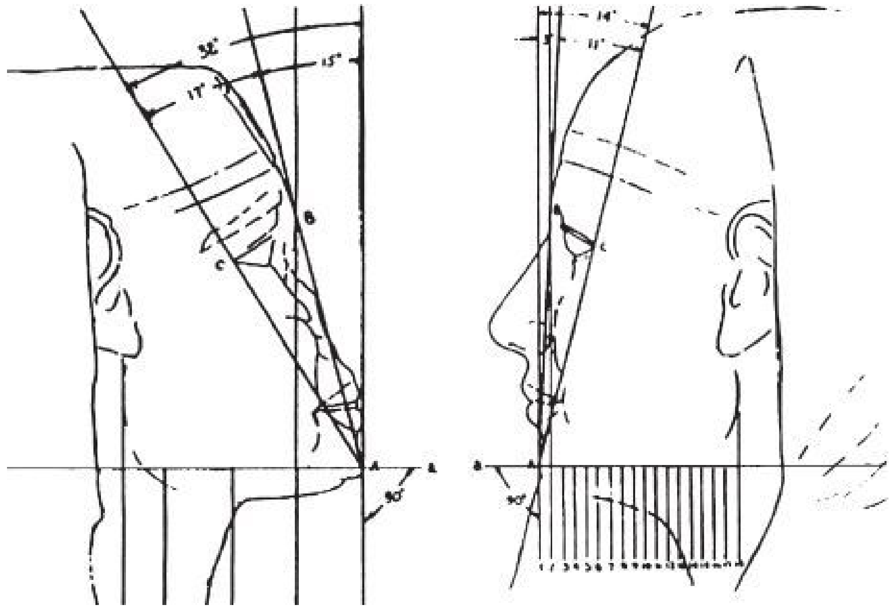


Fig. 4.8. Drawing by Detective Frank Domingo. The profile of the Great Sphinx (on the left) is compared to the profile of Khafre/Chephren (on the right).

Domingo also referred to the jutting jaw of the Sphinx, noting that it had almost twice the eye-to-chin angular protrusion than that measured on the statue of Khafre. This led him to state that the facial features of the Sphinx were consistent with typical African facial structure.

The same conclusion as Domingo was reached independently by Dr. Sheldon Peck, an orthodontist from Massachusetts, who wrote to the editor of the *New York Times* that “the analytical techniques . . . Detective Frank Domingo used on facial photographs are not unlike methods orthodontists and surgeons use to study facial disfigurements. From the right lateral tracing of the statue’s worn profile a pattern of bimaxillary prognathism is clearly detectable. This is an anatomical condition of forward development in both jaws, more frequently found in people of African ancestry . . . the face of the Sphinx is likely of a black African” (Peck 1992).

One would think that Domingo’s and Peck’s testimony would have settled this matter of ethnicity of the Sphinx once and for all. However, in 1999 another group of scientists, from the Forensic Institute in Germany, examined the Sphinx’s face with state-of-the-art computer graphics and concluded exactly the opposite: that a number of the features of the Sphinx’s face *did* match those of Khafre, *especially the jaw!*[*25]

Go figure! If forensic experts in Germany can arrive at totally opposing conclusions to those of a forensic expert in America, all we can conclude is that it does not say much about forensic experts! Although we tend to incline more toward Domingo’s conclusion, we are nonetheless reminded of a commentary about experts made by journalists Christopher Cerf and Victor Navasky, the founders of the Institute of Expertology in New York, who after collating thousands of claims, commentaries, and declarations made by “experts” from ancient Greece to present times, were compelled to declare that the majority are “wrong about facts, they are wrong about theories, they are wrong about dates, they are wrong about geography, they are wrong about the future, they are wrong about the past, and at best they are misleading about the present” (Cerf and Navasky 1984, xxiii). We are not saying, of course, that experts can never be right, but we are definitely saying that they can make mistakes like everyone else. This is especially true for “experts” in Egyptology.

THE EXPERTS' "BATTLE OF THE BEARD"

Ironically, the biggest blow to the Sphinx = Khafre consensus came not from outside Egyptology but from *within it*. As we have seen in chapter 3, Egyptologists Rainer Stadelmann and Vassili Dobrev rejected the Sphinx = Khafre consensus and put forward their own royal contenders: Stadelmann championed Khufu (Khafre's father); Dobrev championed Djedefre (Khafre's eldest brother). These normally sedate Egyptologists have since engaged in academic mudslinging in the media, each hotly defending his own candidate for Sphinx-ship expertise! One of the main points of their debate was about the Sphinx's beard or, to be more precise, whether the Sphinx had originally donned a beard and, if so, what type of beard might it have been.

We recall from chapter 3 how in 1817–1818 Captain Giovanni Battista Caviglia found parts of the Sphinx's beard, at least one of which was then sent by Henry Salt to the British Museum in London. The beard fragment (which has now broken into two pieces) is today displayed in a glass compartment on the ground floor of the museum. Another piece was found in 1896 by an American tourist, Colonel George Edward Raum from San Francisco, who somehow got a *firman* (permit) to excavate at the Sphinx. According to the *Boston Evening Transcript* of March 19, 1886, "Colonel George Raum of San Francisco, with the Khedive's permission, has made excavation at the foot of the famous Sphinx at Ghizeh, and even inside the stone monster." During these excavations Raum unearthed a large fragment of limestone that was inscribed with a few large hieroglyphs and (wrongly) assumed that this fragment was part of the "crown" of the Great Sphinx. Raum reported his discovery to the *Scientific American*.

> *Cairo, Egypt, February 29, 1896*
> *To the Editor of the Scientific American.*
>
> *Dear Sir: I enclose a rough sketch of a portion of the rock crown of the Sphinx found by me. This portion of the stone crown or diadem of the Sphinx was found at the bottom of the temple, between the forepaws, on February 26, 1896. Originally this stone crown was in all probability ten feet broad and as high again, with a stone stem seven feet long, which fitted into the perpendicular hole in its head, to hold it on. We now know how the Sphinx originally looked.*
>
> *Yours Truly, George E. Raum*

This strange story hit the headlines of the *New York Herald* of March 20, 1896, and grabbed the attention of the famous explorer-journalist Henry Morton Stanley (of "Doctor Livingstone, I presume" fame). Stanley excitedly commented on Raum's discovery, writing, "What a sight it must have been when on its head was the royal helmet of Egypt." But it was eventually realized that this alleged "crown" or "royal helmet" was in fact a piece of the Sphinx's beard. Raum, who was also an accomplished artist, painted a scene showing himself with two Arabs near the discovery that he made. The painting is now at the Smithsonian American Art Museum in Washington, D.C.

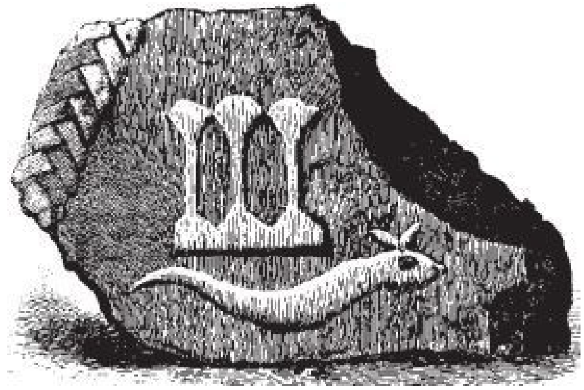


Fig. 4.9. Diagram of the "rock crown" by Colonel George Edward Raum, Scientific American, *April 11, 1896.*

Fig. 4.10. Part of the painting of his discovery by Colonel George Edward Raum, seen here with two Arabs near the left paw of the Sphinx. The piece of the beard is resting against the paw.

Fig. 4.11. The face of Khafre with a beard (left). The face of Khufu without a beard (right). (Photos courtesy of R. Bauval.)

All the recovered pieces of the Sphinx's beard show that it was plaited, and according to Egyptologists this type of plaited beard only came into fashion in the New Kingdom, thus one thousand years *after* Khufu and Khafre. The consensus, therefore, is that the plaited beard was added in the New Kingdom, probably by Tuthmoses IV when he freed the statue from the encroaching sand. Also this beard on the Sphinx apparently had a curled tip known as "divine beard" or "Osirian beard," which was only for divinities and not for living pharaohs, implying that Tuthmoses IV saw the Sphinx as a god and not a pharaoh. To put it more bluntly, nearly all Egyptologists agree that the Sphinx originally *did not have a beard*. And since Khafre was *always* depicted with a beard, then this is seen as proof by Stadelmann and Dobrev that the Sphinx's face could not be Khafre's face. Whereas Khufu, on the other hand, was always portrayed *without* a beard, and thus for Stadelmann, Khufu is a better candidate for the creation of the Sphinx, and for Dobrev it is Djedefre, son of Khufu, who is a better candidate. Stadelmann, and Dobrev also noted that the style of the pleats of the head cloth of the Sphinx, known as the *nemes*, was only used by Khufu.

Stadelmann: "The Sphinx has the earlier, one could say: old fashioned, fully pleated type of nemes headcloth . . . the same nemes, fully pleated, can be seen on the fragment of a statue of Khufu in the Museum of Fine Arts, Boston, which comes from Khufu's pyramid temple" (Stadelman 2000, 468).

Dobrev: "The nemes of the Sphinx is pleated. Two small pleats and one large repeated one after the other. This type of nemes was used for at least one statue of Khufu" (Dobrev, at 16:20, www.youtube.com/watch?v=https://youtu.be/2ODme0B7rlU). (Accessed November 15, 2016)

To counteract these seemingly irrefutable arguments, Lehner modified his own argument by suggesting that contrary to what Stadelmann and Dobrev believed, the Sphinx *did* have a beard like that of Khafre's but that later plaits *were added to it* in the New Kingdom to conform with the fashion of the time. Lehner then pointed to a protrusion on the Sphinx's chest that might have served as a support for the beard. But regarding the pleats on the Sphinx's nemes being the same as on the statue of Khufu, as far as I know Lehner has no response. At any rate, Egyptologist Paul Jordan explained Lehner's position on this argument.

> Dr. Lehner takes up earlier Egyptological [sic] opinion that the beard of the Sphinx is of the "divine beard" pattern (tightly plaited and curled up at the tip) never seen on royal statuary in Old Kingdom times but featured in relief depictions of the gods from Dyn. V. On the basis of a long study of the Sphinx, he concluded that the detailed similarity of the rock layers in the beard fragments and in the body of the monument [the Sphinx] demonstrate that the beard was not an addition but part of the original execution of the Sphinx design. (Jordan 1998, 182)

According to British Egyptologist I. E. S. Edwards, however, the alleged "support" on the breast of the Sphinx was not for the beard but for "a figure, possibly of the king, [that] was carved in front of the chest, but scarcely any trace of it now remains" (Edwards 1993, 121). To be fair, Lehner did agree with Edwards but nonetheless maintained that the statue was a later addition, which, in any case, stood a little farther away from the alleged support for the beard.

It should be clear by now that Egyptologists spend much energy and time interpreting evidence to support or debunk one another's pet theories, depending, of course, on which side of the fence they stand. As far as we are concerned it does not really make much difference whether the Sphinx's face is that of Khufu or Khafre, since we are convinced not by such artistic interpretations but by *scientific evidence* that the original Sphinx long predates these two pharaohs. We nonetheless agree that the Sphinx's face could be the face of a Fourth Dynasty king, but only because we are also convinced that one such king *remodeled* the original face of a lion to make it look as his own.

We also are inclined to agree with Stadelmann and Dobrev that the evidence of the pleated nemes strongly points in favor of Khufu, but with a twist: *that Khufu was not the creator but the usurper of the Sphinx*. We have examined photographs of the fragments of the statue of Khufu referred to by Stadelmann—which is now at the Museum of Fine Arts in Boston—that indeed confirm the claim about the pleats on the nemes being the same as those of the Sphinx. These fragments were apparently found near the Great Pyramid alongside other objects, including the base of a statue that bore the name of Khufu.

An archaeological find that seems to support our view that Khufu *remodeled* an original face of a lion is a small brown limestone head of a lion found by Egyptian archaeologist Selim Hassan near the pyramid of Khufu during the 1940s. He wrote, "In the filling of the solar-boat to the north of the causeway was found the head of a lion in brown sandstone. It is very finely carved and life-like (PI. XI C)" (Hassan 1960, 37). It must also be pointed out that statues of human-headed lions (i.e., sphinxes) were unknown during the Fourth Dynasty.[*26] On the other hand, there are many lion statuettes that date from the First or Second Dynasties, and perhaps even from before. All this strongly supports, if not proves, that the narrative of the Inventory Stela claiming that Khufu carried out embellishment works on the Great Sphinx is historically true, and if so, then such "embellishment" might have been the remodeling of the original lion head into a human one wearing the royal headdress to resemble Khufu.

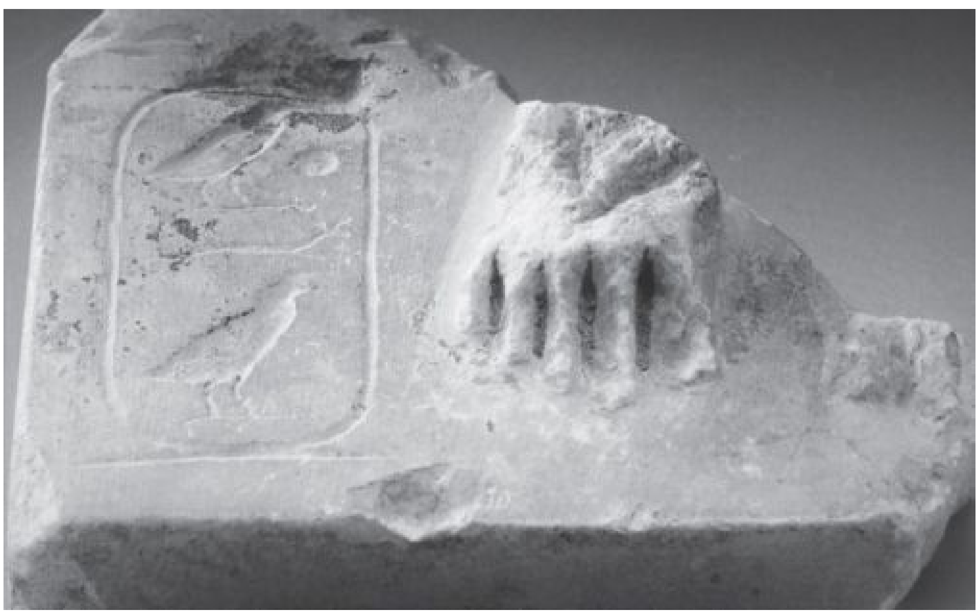


Fig. 4.12. Fragment of an alabaster statue of Khufu. Note the cartouche with the king's name. This was almost certainly the base of the statue from which the fragments of the nemes in fig. 4.13 came from.

Fig. 4.13. Alabaster fragments of the nemes from a statue of Khufu. The face would be on the right side.

Fig. 4.14. Head of a lion (or lioness?) found near the Great Pyramid by Selim Hassan.

Let us state again clearly this important point:

We do not believe that Khufu or his sons created the Sphinx, but only restored and refashioned it. We are also convinced that the story told in the Inventory Stela (see chapter 3) about Khufu restoring, refashioning, or embellishing the Great Sphinx is historically true. As for the perceived "African" and "Negroid" features of the Sphinx's face, we have no problems with this (and neither should anyone else), for it is possible that Khufu may have had Nubian genes.[*27]

In order to know the true identity of the Sphinx we must turn to the ancient Egyptians themselves; after all, if anyone knew who or what the Great Sphinx originally represented, it surely must be them.

STRANGE AND SURPRISING SILENCE

When I first began to study the Great Sphinx in the early 1990s, I was puzzled at Egyptologists' insistence that there was no mention of the Great Sphinx *before* the New Kingdom (see epigraphs at the beginning of this chapter). Thus, according to Sir Flinders Petrie, "There is no figure or mention of the Sphinx itself on a single monument of the Old Kingdom" (Petrie 2013, 52). This view is still propagated today, as, for example, by Jaromir Málek, Ph.D., of the University of Oxford's Griffith Institute, who emphatically stated, "Old Kingdom sources are strangely and surprisingly silent about the Great Sphinx of Giza [and] it was only some 1000 years after the Sphinx had been made . . . that it is mentioned" (Málek 1986, 10). In the same vein, the French Egyptologist Christiane Zivie-Coche asserted with absolute confidence that "there are no references to the Sphinx in texts from the Old Kingdom" (Zivie-Coche 1997, 89).

If Egyptologists are correct about this, then we must believe that from the Old Kingdom to the New Kingdom, a period of about one thousand years, there was not one king or priest or scribe or indeed anyone in Egypt who could be bothered to mention the Sphinx on a tablet or a stela or a papyrus or in a tomb or pyramid or temple or indeed on anything at all! It is not that Old Kingdom Egyptians did not know how to write or draw, because there are dozens of tombs from that epoch full of inscriptions and drawings, not to mention the prolific Pyramid Texts inscribed on the inner walls of pyramids of the Old Kingdom. So how can we explain this "strange and surprising silence"?

AN OLDER NAME FOR THE GREAT SPHINX

Ironically, Zivie-Coche inadvertently gave the answer to this "strange and surprising silence" when she admitted that "the Sphinx was also called Harakhty and Re-Harakhty" (also written "Horakhti" by other Egyptologists) (Zivie-Coche 2002, 87), but then she quickly explained that "there was theological play based on the god's name." So Zivie-Coche, herself being a self-appointed, peer-supported, accredited mind reader of New Kingdom Egyptians (excuse the sarcasm), is unabashedly and authoritatively telling us that these names, however, should not be considered because she knows (we may wonder how) with absolutely academic certainty that there was "theological play based on the god's name." Well, we do not agree with the good doctor, and for good reason, as we shall now see.

During his excavations around the Great Sphinx in the 1930s, Hassan found dozens of votive stelae that confirmed that "side by side with the name *Hor-em-akhet*, we find the Great Sphinx also called *Hor-akhty*" (Hassan 1949, 138; italics added). The association of the names Horakhti or Ra-Horakhti with the Sphinx was also noted by Egyptologists Cyril Aldred (2001, 142, 237) and Donald Redford (1997, 20). Hassan also found a depiction on a tomb at Giza belonging to a prince of the Old Kingdom showing a man kneeling in adoration before the Great Sphinx with the caption, "Adoration to Hor-akhty, the Great God, the Lord of Heaven" (Hassan 1949, 56). There can be no doubt, therefore, that the Great Sphinx was regarded as a manifestation or symbol of Horakhti. It is therefore somewhat perverse that with all this evidence, Zivie-Coche and others like her keep on insisting that "there are no references to the Sphinx in texts from the Old Kingdom." We say perverse because these experts are (or should be) aware that there are numerous references to Horakhti in the Pyramid Texts, which date from the Old Kingdom (i.e., the pyramid age)! They would reply, of course, that the name Horakhti, which is well attested in the Old Kingdom and the Pyramid Texts, does not refer to the Great Sphinx at all but to a solar deity. But Hassan, however, long ago pointed out that this is not so: "It has hitherto been thought that sphinxes were not referred to in writing until the time of the Eighteenth Dynasty, but, as we shall see below, careful and patient study has revealed to us that the Sphinx was known and mentioned in the Pyramid Texts, which in their written form date to the end of the Fifth Dynasty, but of which many parts have a far earlier origin" (Hassan 1949, 221).

Hassan went on to say that the use of the name Horakhti (Horus of the Horizon) to denote the Great Sphinx "has a profoundly interesting meaning . . . for it penetrates into the very roots of the Egyptian religion" (Hassan 1949, 232).

"Profoundly interesting meaning . . ."?

Let's see why.

THE LION, THE FALCON, AND THE MAN

In various depictions of Horakhti this deity could be represented in several ways, sometimes as a lion with the head of a man or a falcon, or a man with a falcon's head, or, more commonly, a falcon with a sun disc above its head (Hassan 1949, 232). More intriguingly, starting with Amenhotep III (the son and successor of Tuthmoses IV and father of Akhenaten), it became common to make statues of Horakhti as sphinxes, that is a lion with a man's head or a falcon's head wearing the royal double-crown of Upper and Lower Egypt. There are two fine specimens from Luxor carved in syenite red granite that can be seen today at the entrance of a pier in front of the Academy of Arts in St. Petersburg, Russia. These sphinxes bear the cartouche of Amenhotep III and are dedicated to Re-Horakhti. They were acquired for Tsar Nicholas I in 1830, then kept until 1834 in the courtyard of the academy, and finally placed at the entrance of the new pier designed by the architect Konstantin Thon.

Fig. 4.15. The sphinxes of Amenhotep III in St. Petersburg.

Fig. 4.16. Sphinxes of Ramses II with falcon or man's head wearing royal double-crown from the Temple of Seboua on the shore of Lake Nasser in Lower Nubia.

There are also many votive stelae, albeit from the Late Period, that depict the Great Sphinx with the royal double-crown and the "divine beard," all of which strongly suggests that at one time the Great Sphinx may have been adorned with a similar headdress.

Fig. 4.17. Two examples of the many votive stelae depicting the Great Sphinx wearing the royal double-crown.

However, the two sphinxes depicted on the Dream Stela of Tuthmoses IV, which undoubtedly represent the Great Sphinx, *do not* have the royal double-crown. Why? And why did his son, Amenhotep III, add the royal double-crown to the many sphinx statues he commissioned?

We recall that it was the father of Tuthmoses IV, Amenhotep II, who first called the Great Sphinx by its two names, Horemakhet *and* Horakhti, on the Great Limestone Stela found by Hassan in the temple next to the Sphinx (see chapter 3). As Hassan explains:

> Up to now, the earliest authentic opinion concerning the Sphinx is given by Amenhotep II, but even this was written nearly 1,400 years after its erection, and no mention is made of its originator. On his great limestone Stela, Amenhotep refers to the "Pyramids of *Hor-em-akhet*," a name which perhaps shows that he considered the Sphinx to be older than the Pyramids. He refers to the Sphinx under the names of *Hor-em-akhet* and *Hor-akhty* [which means "Horus in the Horizon" and "Horus who dwells in the Horizon," *the latter being a god mentioned in the Pyramid Texts as being older than Ra*.] (Hassan 1949, 75–76; material in brackets added)

Amenhotep II's wife, Queen Tyaa, also dedicated a stela to the Sphinx, which she had placed in the temple built by her husband near the great statue. She appears to have regarded the Sphinx as a combined idol of Atum and Horakhti, as is clear from her statement, "Everything which is coming forth before Atum-Horakhty" (Hassan 1949, 78). But what could explain the addition of the royal double-crown in depictions of the Great Sphinx on statues belonging to Amenhotep II and Rameses II, and on the many votive stelae of the Late Period?

A HOLE IN THE HEAD

Since at least the mid-seventeenth century, various foreign travelers have reported that there was a deep, circular hole in the head of the Sphinx. There is, for example, the account of a Frenchman named Jean de Thévenot, who in 1665 reported a story told to him by a Venetian traveler who had climbed on the head of the Sphinx with some companions and "found a hole in the top of the head, and upon entering inside it saw that it began narrower until it neared the breast, and then it stopped" (Thévenot 1665, 135). A British traveler, Thomas Shaw, gave a more detailed account when he visited the Giza Necropolis in 1721: "Upon the head of it there is . . . a hole. Of a round figure . . . [which is] five or six feet deep and wide enough to receive a well-grown man" (Shaw 1738, 375). These reports are quite correct. There is—or rather was—in fact, a hole in the crown of the head of the Sphinx as described by Shaw, and it was still visible until 1925, when, for esthetic reasons we suppose, it was filled and covered up with cement by the French archaeologist Émile Baraize (Hassan 1949, 21). Hassan also speculated as to what may have been the function of this hole: "The hole which existed in the top of the head may have originally been a socket for the insertion of a crown of wood, stone or metal" (Hassan 1949, 103).

The same idea also occurred to Edwards, who wrote, "There was a hole in the top of the head, which may have been a socket for attaching a crown, but it has been filled with cement in modern times and is no longer visible" (Edwards 1993, 121).

We are inclined to agree with Hassan and Edwards that the hole in the Sphinx's head was a "socket" for securing a crown, probably the royal double-crown depicted in the various votive stelae. Another possible giveaway is the unusually flat head of the Great Sphinx, implicit that it may have had a large object placed on it. We are also inclined to think that the royal double-crown was added to the Great Sphinx by Amenhotep III . . . but if so, why?

On the Dream Stela and the Great Limestone Stela, as well as the many votive stelae found at Giza depicting the Great Sphinx, it is obvious that the statue is seen as Horemakhet, but is also given all the attributes of the sun god by calling it Horakhti, Atum, Re, Khepri, or various combinations of these names. And although the first pharaohs to use the name Horemakhet for the Great Sphinx are Tuthmoses I and Tuthmoses III (Hassan 1949, 72), and their successor, Tuthmoses IV, while calling the Great Sphinx Horemakhet, also used other names, such as Atum, Horakhti, Re, and Khepri, very much as a Christian king might refer to a statue of the Madonna as St. Mary, the Mother of God, Holy Mother, the Virgin, the Immaculate, and so on; or a statue of Jesus as Christ, the Savior, the Son of God, the Lamb of God, the Redeemer, and so on. It is often said by Egyptologists that Khephri represented the sun at rising, Re the sun at noon, and Atum the sun at setting, while the combined name Re-Horakhti is the sun as it travels daily from east to west. In other words, these various names are for the same entity seen from different perspectives or, as the case may be, the solar disc at different times of the day. But if Horakhti was some sort of "celestial" or "cosmic" Sphinx in the Pyramid Texts, as Hassan is implying, then where is it in the sky? A clue is given by American Egyptologist Richard Wilkinson, who writes, "As horakhty or 'Horus of the two Horizons,' Horus was the god of the rising and setting sun, but more particularly the god of the east and the sunrise, and in the Pyramid texts the deceased king is said to be reborn in the eastern sky as Horakhty" (Wilkinson 2000, 201).

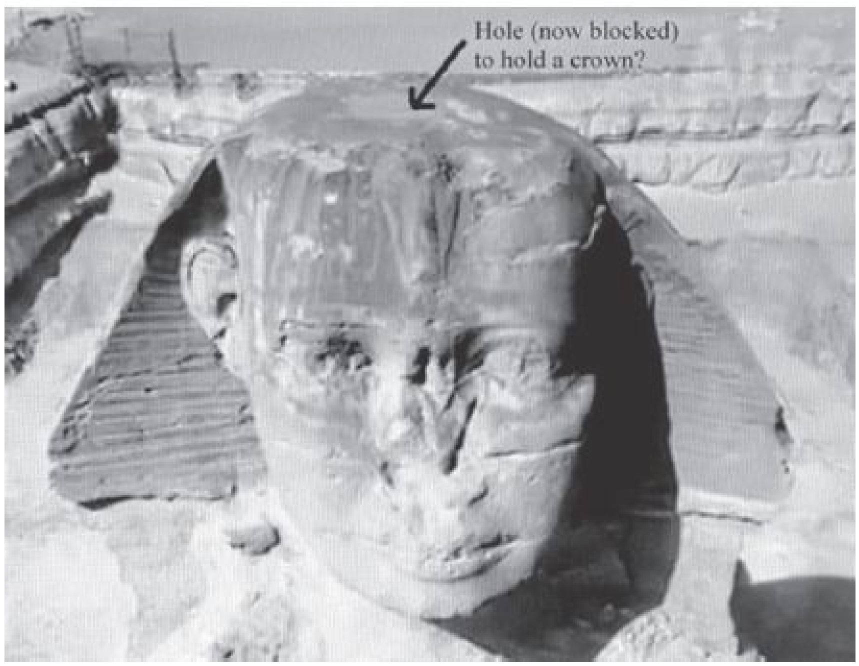


Fig. 4.18. Photo pre-1925, with hole still open (left). Photo in 2013, hole now cemented (right).

Another important intimation is given in line 2 of the Dream Stela, where it is proclaimed of the king, "Live the good God, Son of Atum, Protector of Horakhti, living image of the Sphinx, begotten of Re, excellent heir of Khepri; beautiful of face like his father, who comes forth . . . equipped with the form of Horus upon him."

And then in line 9, the Great Sphinx speaks to Tuthmoses IV with these words: "I am your father, Horemakhet-Khepri-Re-Atum." One has to read these lines several times to finally realize that although the actual stone statue of the Sphinx is Horemakhet, it nonetheless seems to also have a cosmic counterpart associated with the sun god. We now recall from chapter 1 how Polish Egyptologist Karol Mysliwiec in his study of Atum highlighted the belief by the ancient Egyptians that this god is associated with a primordial lion (Mysliwiec 1978). The association of Atum with the sphinx and the primordial lion was also forcefully made by Egyptologist Eduard Naville at the first annual meeting of the Egypt Exploration Fund (now Society) in July 1883, when he stated, “There can be no doubt that the lion or the sphinx is a form of Atum” (Naville 1883, 193; Naville 1924, 13). It is therefore extremely relevant that Atum also wore the royal double-crown when shown in his anthropomorphic form.

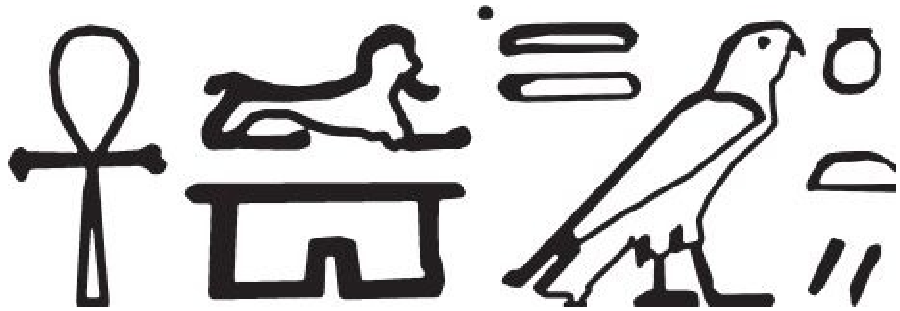


Fig. 4.19. From line 2 of the Dream Stela: “Horakhti, living image of the All Lord” (the Great Sphinx on the temple or podium).

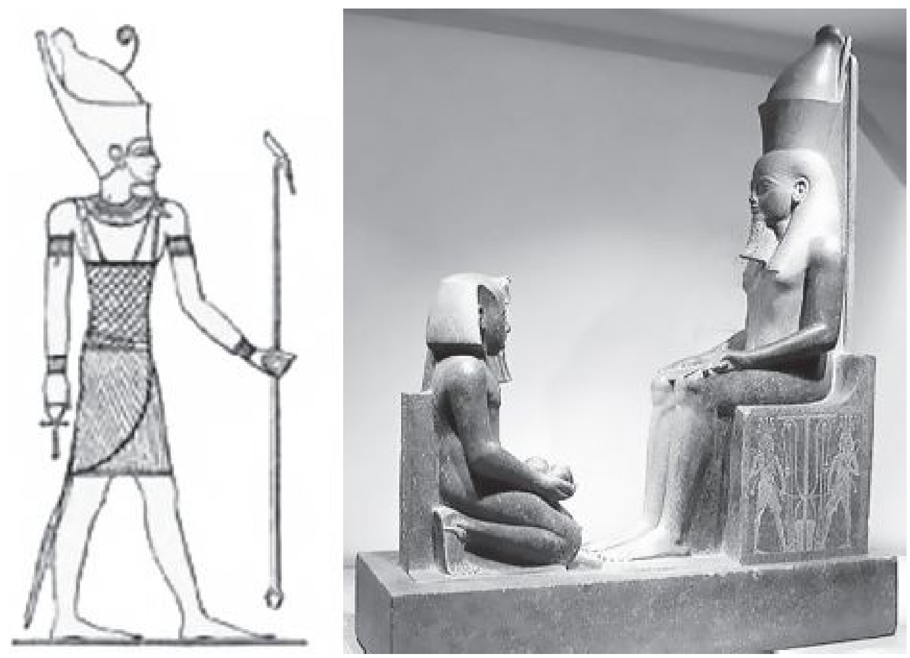


Fig. 4.20. Atum of Heliopolis (left), Atum on the throne (right; Luxor Museum).

Further clues are to be found in the famous papyrus of Ani. There is a vignette that accompanies spell 17 showing Atum sailing on a sky-boat toward a couchant lion on a shrine. Above the lion’s head are three large papyrus plants, with one having a cobra wrapped around it, and on the front of the lion is a ewer with a large lotus flower on it. This scene is extremely reminiscent of the votive stelae, which also often show three large papyrus plants over the head of the Sphinx and ewers on stands with a lotus flower on their top.

Fig. 4.21. The god Atum inside the sun disc sailing toward his own image in the form of a couchant lion. The head-to-body proportion of the lion is uncannily similar to that of the Great Sphinx.

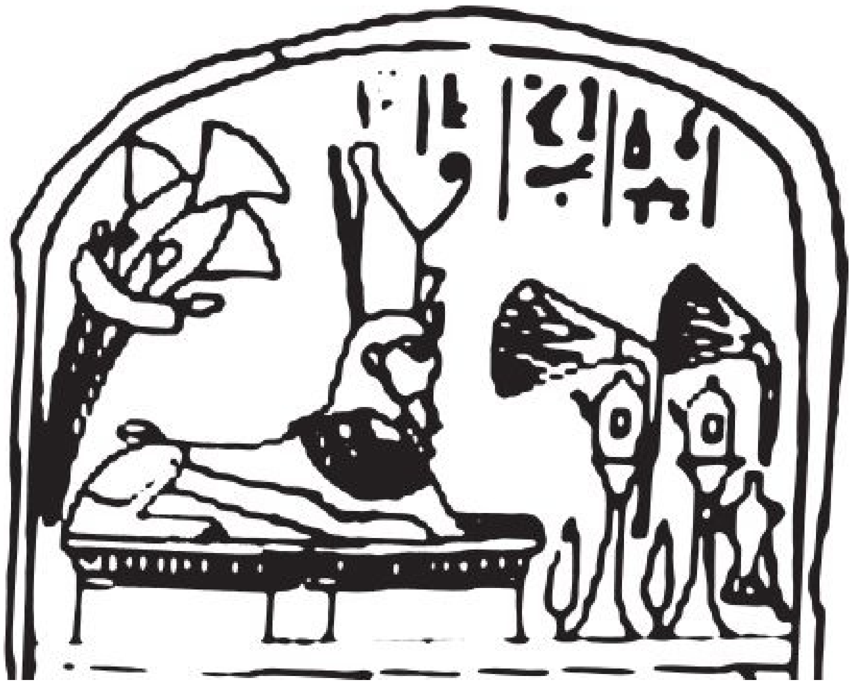


Fig. 4.22. A votive stela of the Late Period.

Fig. 4.23. The god Hapi.

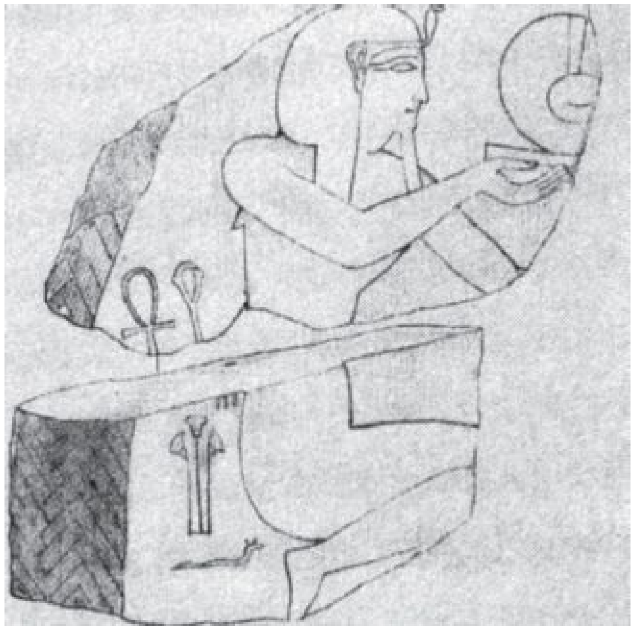


Fig. 4.24. Fragments of the beard of the Sphinx.

The three papyrus plants are the symbol of Lower Egypt and also the symbol for the god of the Inundation, Hapi (Shaw and Nicholson 2008, 139). Interestingly, three similar large papyrus plants are also carved on the stone that held the beard of the Great Sphinx.

THE INUNDATION AND THE SPHINX

The place where the Great Sphinx stands today is about eight kilometers from the Nile River. The area in front of the Sphinx is heavily urbanized and, of course, does not look at all the way it did in ancient times, when the Inundation of the Nile would come very close to the Giza Plateau. It is difficult for us today to understand how crucially important the Inundation was to the ancient Egyptians. Their very lives, quite literally, depended on it. An ideal Nile Inundation season began around the end of June, when the waters of the river began to rise, and reached its peak in mid-September, when the adjacent land was fully flooded; after which the water receded, leaving a rich, fertilizing detritus on the soil, and the sowing season then began. My own parents recalled how it used to be around the Giza area when the Inundation was at its peak and villagers went about their business in small boats. It was like an Egyptian Venice, with people sailing from house to house on small boats.

The end of June, the opening of the Inundation season is, of course, the time of the summer solstice. From the early dynastic era in Egypt, circa 3100 BCE to about 2000 BCE, this time of the year was marked by the sun entering the zodiacal constellation of Leo. Also witnessed was the dawn (heliacal) rising of the star Sirius, the star of Isis and the Nile, after seventy days of invisibility in the "underworld."[*28] The goddess Isis was, of course, the quintessential virgin of the ancient world and most likely the archetypal model for the Christian Virgin, the Madonna. Could this explain why so many travelers who visited the Great Sphinx in the sixteenth and seventeenth centuries often reported that the Sphinx was a symbol of the Nile Inundation as well as an "idol of Isis" or the zodiacal sign of Virgo?

Fig. 4.25. The Nile in full Inundation near the Giza necropolis, circa 1890.

It was often reported by early Western travelers that the Nile Inundation season was bracketed by the “sign of Leo and the sign of Virgo” (Temple 2009, 444–505). But although this holds true for the epoch from 3100 BCE to 2000 BCE, it was not the case for the sixteenth to eighteenth centuries CE, when these travelers visited Egypt. This is because the phenomenon of the precession of the equinoxes caused the zodiacal belt to slowly rotate counterclockwise by one sign every 2,160 years (i.e., the precessional cycle divided into twelve parts (25,920/12 = 2,160).[†29]

In modern times the sun at Inundation time is in Taurus. The insistence by early travelers that the sun was transiting in Leo and Virgo at least suggests, if not proves, that there might have been a folk memory that was passed down the generations. Interestingly, the author Robert Temple came across a book by a Frenchman, M. Joos van Ghistele, who had visited Giza in the fifteenth century and was told a story by a local dragoman about the Great Sphinx, which seems to be based on a story told three thousand years earlier! “One day in those times [of idolatry] one man went there to make some sacrifices; he asked of the idol [the Sphinx] what was going to happen to him, and the head [of the Sphinx] replied to him that he would become king and master of Egypt if he wanted to follow its counsels. Thereupon the man replied that he would follow them, and it happened that the man became king of Egypt” (Temple 2009, 148–49).

Here is the relevant (edited) extract from the Dream Stela to compare the stories:

> One of those days it came to pass that the King’s son Thothmes came, coursing at the time of mid-day, and he rested in the shadow of this Great God [the Sphinx]. Sleep seized him at the hour when the sun was in its zenith, and he found the Majesty of this Revered God [the Sphinx] speaking with his own mouth, as a father speaks with his son, saying: “Behold thou me, my son, Thothmes, I am thy father, Hor-em-akhet-Kheperi-Ra-Atum; I will give to thee my Kingdom upon earth at the head of the living. Thou shalt wear the White Crown and the Red Crown upon the Throne of Geb, the Hereditary Prince. . . . The sands of the Sanctuary, upon which I am, have reached me; turn to me in order to do what I desire.” (Hassan 1949, 195–196)

It is, of course, quite possible that the local dragoman who told the story simply made it up to impress his foreigner guest. The other explanation, which seems very difficult to accept but is nonetheless possible, is that the story was passed on by word of mouth across the many generations. My own experience with something quite similar is with the stories told by Bedouins in the western desert of Egypt about a "lost oasis," which had been the home of a very ancient people. Although modern scholars assumed these stories to be pure fantasy, in 1923 the Egyptian desert explorer Ahmed Hassanein Bey did find a "lost oasis," which he called Gebel Uwainat,[*30] today an uninhabited mountain region where vestiges of a prehistoric people were found (Hassanein Bey 2006).

Five millennia separate us from the Old Kingdom, yet Egyptologists can read the names of kings or nobles inscribed in tombs and chapels, and even in one particular case, that of the sepulcher of Meresankh III, a daughter of King Khufu, builder of the Great Pyramid, the time of year the person died and was buried (Simpson and Dunham 1974). Indeed, in a recent publication titled *The Complete Royal Families of Ancient Egypt*, Egyptologists Aidan Dodson and Dyan Hilton assure us that their book "illuminates the lives of some 1300 kings, queens, princes and princesses" and has "specially conceived genealogical tables that show the interconnection between members of various dynasties" (Dodson and Hilton 2004, blurb on cover). So if Egyptologists can confidently illuminate "the lives of some 1300 kings, queens, princes and princesses" of ancient Egypt, why couldn't the ancient Egyptians themselves do the same for their own ancestors? It is well known that ancient Egyptians from earliest times trained scribes in temples to keep records and annals and also, when the need arose, to copy older writings on more durable surfaces. A good example of this is the Shabaka Stone, which today is kept in the British Museum, where the scribe explained that the text on this granite block was copied from an older document made of leather because "it was found to be worm-eaten" (Lichtheim 1975, 51). I am of the strong opinion that such written records must be matched with the iconography attached to them, especially if these writings are referring to astronomical or astrological events.

Let us see how this idea may be applied to the text and iconography on the Dream Stela of the Sphinx.

THE WATER BEARER

It was in the Late Period that the Great Sphinx was first depicted with the royal double-crown and the three large papyrus plants over it. This happened to also be the epoch when the astronomical zodiacs seen in tomb and temple first appeared in Egypt. I strongly suspect, therefore, there is a link between the zodiacs and these depictions of the Sphinx. Let us examine this more closely.

The most famous of Egyptian zodiacs is found on the round planisphere at Dendera (also known as the Round Zodiac). This artifact was removed from its original location and taken to France in the 1820s and is today displayed at the Louvre Museum in Paris. On its central part are depicted the twelve traditional Babylonian signs of the zodiac, with the sign of Leo shown as a striding lion on a boat. Directly opposite is the sign of Aquarius, shown as a standing man pouring water from two vessels (i.e., a water bearer). This human-made figure is also clearly depicting Hapi, the god of the Nile Inundation. However in this particular case Hapi is *not* depicted with the usual headdress of three papyrus or lotus plants, as we have previously shown, but instead wears the royal double-crown normally reserved for kings or kingly deities, such as Atum and Horus and, more especially, Horus of Behdet, or Behdety (also known as Horus of Edfu).

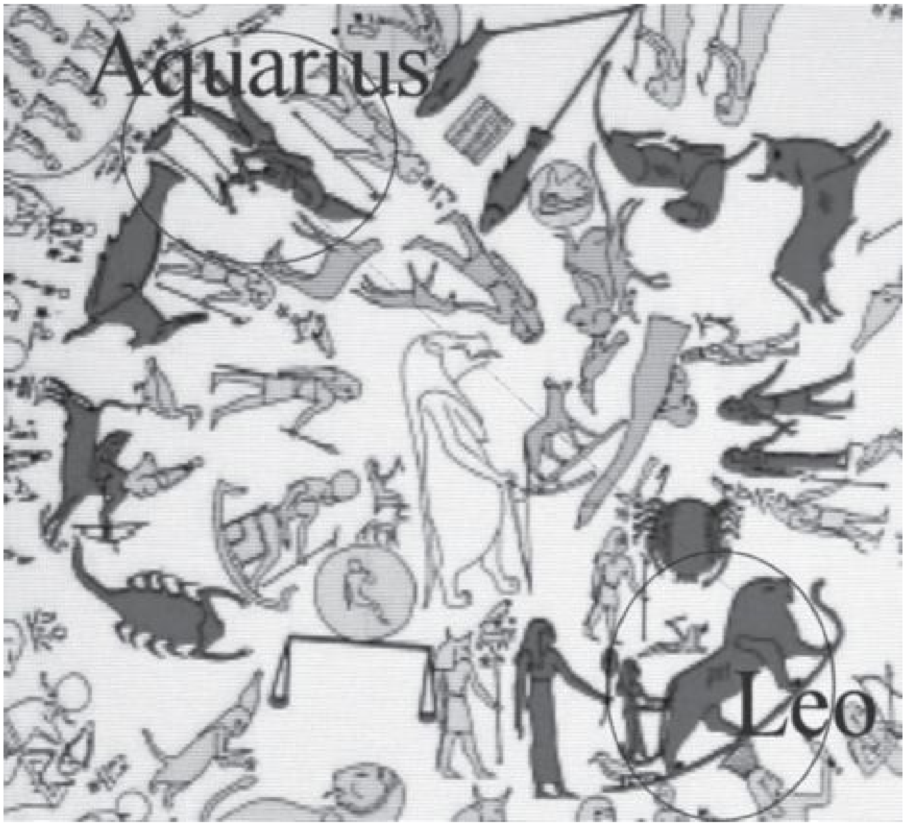


Fig. 4.26. Drawing of the Round Zodiac of Dendera. Note Leo and Aquarius in opposition. (Courtesy of R. Bauval.)

Fig. 4.27. Detail from the Round Zodiac of Dendera. Hapi, the god of the Inundation, as Aquarius. Note the gesture of pouring water (i.e., Hapi as a divine water bearer). The giveaways are the pendant breasts and potbelly of Hapi. (Courtesy of R. Bauval.)

It is not surprising, therefore, to find that Horus of Behdet (i.e., Behdety) is also depicted in many of the votive stelae found near the Sphinx, except that here he is shown as a winged disc hovering over the Sphinx (Hassan 1949, 79–84). In this form, Horus of Behdet almost certainly represents the noon sun at the meridian. At the entrance of the inner sanctuary of the Temple of Horus at Edfu—Behdet is the ancient name of Edfu—there are two enormous statues of Horus of Behdet as a falcon wearing the royal double-crown. Yet on some of the walls and pillars of the temple, Horus of Behdet is also shown as a lion with a falcon's head, also wearing the royal double-crown.[*31]

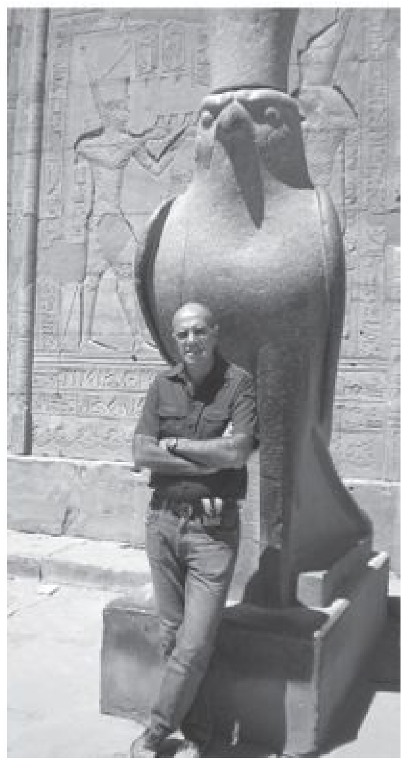


Fig. 4.28. Horus of Behdet, depicted as a falcon with a lion's body (top); Robert Bauval at the Temple of Horus at Edfu (bottom). (Courtesy of R. Bauval.)

It is an observable fact, even in our epoch, that when Leo is seen on the east horizon, Aquarius will be seen at the same time on the west horizon. In other words, an observer watching Leo rising in the east will also see, if he or she then turns 180º, Aquarius setting in the west—and vice versa six months later. We recall how the name Horakhti could also mean "Horus of the two Horizons" (i.e., the east and the west). This raises the tantalizing question, Was Horakhti, and therefore the Sphinx, seen as a *combined symbol of Leo and Aquarius?*

The gesture of Hapi pouring water clearly also symbolizes the Nile's Inundation, for Hapi was primarily the god of the Nile and, more specifically, the yearly flood. Throughout the dynastic period, the Inundation season occurred when Aquarius would be on the west horizon and Leo would be on the east horizon in the predawn. This cosmic connection (i.e., with Aquarius facing Leo) is extremely reminiscent of the pharaoh Tuthmoses IV seen standing and pouring water from a crucible, very much like the water bearer Aquarius, *while facing the Great Sphinx* on the Dream Stela. I am aware that nearly all Egyptologists would now insist that the ancient Egyptians did not know the zodiac until the third century BCE, when it was allegedly imported into Egypt by the Greeks. This may be so, but it does not necessarily mean that the ancient Egyptians did not *observe* the important constellations through which the sun passed in the course of the year and, especially, the constellation that housed the sun during the Inundation season (i.e., Leo) and the constellation in opposition (i.e., Aquarius). We shall see in chapter 5 that there is much in the Pyramid Texts that supports this view.

In the Dream Stela Tuthmoses IV is shown making offerings not to one but to *two* sphinxes, which are shown back-to-back. This same arrangement, in fact, is also depicted on the Great Limestone Stela of Amenhotep II. Why two sphinxes? It is just artistic symmetry or something else . . . something that was actually "seen" at the time?

We recall how Amenhotep II called the Sphinx by two very similar names, as if these names implied a "reflection" of each other: Horemakhet, "Horus *in* the Horizon," and Horakhti, "Horus *of* the Horizon." Now on the Dream Stela one sphinx faces west and the other faces east, and above them is shown a winged-sun disc that surely must denote the midpoint (i.e., the south meridian where the sun disc sits at noon). The "sun at noon" (i.e., midday) is indeed confirmed by the text on the stela, where Tuthmoses IV experienced his epiphany or "dream" while sleeping under the head of the Great Sphinx "when the sun was at the zenith" (i.e., at noon). It is well known that the ancient Egyptians directed themselves by looking south (Málek and Baines 1991, 70). If we accept that the winged-sun disc is at the south meridian —which I am certain is the correct interpretation—then it follows that the sphinx on the left side of the depiction is facing east, as indeed is the case of the Great Sphinx (i.e., Horemakhet). It also follows that the other sphinx on the depiction faces west. Yet it, too, is also called Horemakhet. It is my conviction that we are here not meant to be looking at some artistic balance but rather at a deeper meaning to do with the sky religion of the time. But if some "second sphinx" existed somewhere facing west, *then where is it today?*

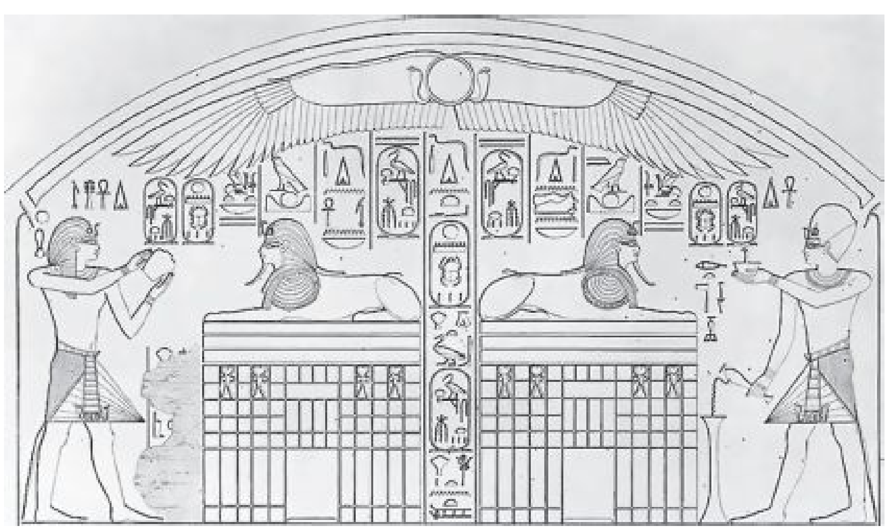


Fig. 4.29. Tuthmoses IV making offerings to two sphinxes on the Dream Stela.

Very relevant to our discussion is yet another stela that was found near the Sphinx, which shows Tuthmoses IV making a similar offering to a sphinx, the latter facing west, but now, most fittingly, it is actually called Horakhti (Hassan 1949, 81). As if to confirm this identification, a similar scene is also found on the stela of a son of Tuthmoses IV, Prince Amenemnabt, where a sphinx again facing west is also called Horakhti, the latter even written "in very large hieroglyphs" as if to emphasize the identification (Hassan 1949, 88)!

But if so, where is this Horakhti sphinx that is facing west? Surely there is no "second Great Sphinx" that faces west, either at Giza or anywhere else as far as the eye can see.

Or is there?

Chapter Five

HORUS WHO DWELLS IN THE HORIZON

Robert Bauval

First, in the dawn of Egyptian history the hawk was the symbol of the Great God of the Western Delta Kingdom . . . and they called him . . . Horakhty.

SELIM HASSAN

In the Pyramid Texts the deceased king is said to be reborn in the eastern sky as Horakhty.

RICHARD H. WILKINSON

IN SEARCH OF THE "SECOND SPHINX"

In the previous chapter we saw how some pharaohs of the Eighteenth and Nineteenth Dynasties depicted two sphinxes back-to-back on stelae that are dedicated to the Great Sphinx of Giza, one facing east and the other facing west. We have also seen how both the names Horemakhet and Horakhti were used for the same entity: the Great Sphinx. So was this arrangement just for artistic symmetry, as Egyptologists think, or could it imply the existence of a second "Great Sphinx"? If so, where could it have been? A good place to consider is on the east side of the Nile . . . facing west.

This possibility, interestingly enough, had in fact occurred in all seriousness to the great British Egyptologist Sir Flinders Petrie in 1922. According to one of his biographers, Margaret Drower, Petrie once had a bit of time to spare after his wife had to leave Egypt at very short notice to attend her mother's funeral in England, so "Flinders stayed on a little in Cairo; he wanted to test a theory that the Great Sphinx at Giza might have had a counterpart on the other [east] side of the Nile; he walked from Maadi over every foot of the ground opposite the pyramids, examining each outcrop of rock, and decided that there was no evidence for a contra-sphinx" (Drower 1995, 353).

In the 1920s, when Petrie went searching for the second sphinx on the east side of the Nile in Maadi, this zone was still undeveloped. Today, however, it is a fashionable urbanized suburb of Cairo for the wealthy. At any rate, had there been the remnants of a sphinx or even a suspect rocky outcrop, Petrie would surely have noticed it. But no such thing was to be seen anywhere. But was Petrie, then, looking in the wrong place?

Is the operative word *heaven* in this case?

Fig. 5.1. Giza in the west, and Maadi area in the east, where Petrie had looked for a "second sphinx." (Courtesy of R. Bauval.)

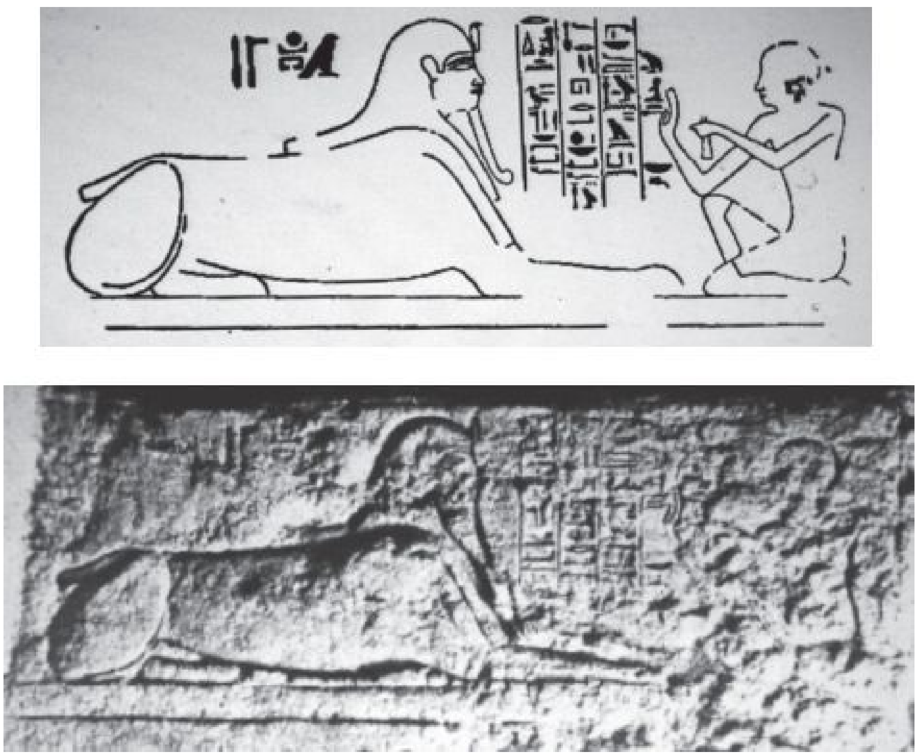


Fig. 5.2. A drawing by Selim Hassan (top) of a relief he found on the facade of an Old Kingdom tomb at Giza shows a man kneeling in front of the Great Sphinx, which is looking west (bottom). The caption reads, "Adoration to Hor-akhty, the Great God, the Lord of Heaven" (Hassan 1949, 56).[*32]

THE LORD OF THE HORIZON

The Egyptologist Ahmed Fakhry, who had also extensively studied the Giza monuments, reminded his colleagues, "The stelae and votive figures of sphinxes, lions, and falcons found around the Sphinx reveal the names under which it was known and worshiped. Most commonly it was called *Horemakhet*, "Horus-in-the-Horizon," or *Horakhti*, "Horusof-the-Horizon" . . . *both are appropriate names*" (italics added) (Fakhry 1969, 164).

There can be little doubt that the actual *physical* Great Sphinx of Giza was called Horemakhet, as from the Eighteenth Dynasty. But why then was it also called Horakhti? Surely the difference between these two names is but a very thin nuance, with the former translating as "Horus *in* the Horizon" and the latter as "Horus *of* the Horizon." What could this minute difference of being "in" and "of" the "horizon" mean? Are we to consider two quasi-similar names for the same entity . . . or two similar entities having quasi-similar names?

From the arrangement of the scene on the Dream Stela it would seem that we are meant to consider an astronomical scene, with the observer facing south at noon. In this scene the sphinx on the left and facing east would be the actual Great Sphinx (Horemakhet), the other sphinx, facing west, would be some imaginary cosmic "Great Sphinx," while the drooping wings above the two sphinxes would represent the path of the sun from east to noon to west.

We have already noted in chapter 4 that the winged solar disc was known as Behdety, a well-known symbol of "Horus of Behdet" or "Horus of Edfu." This is confirmed in many inscriptions in the Temple of Horus at Edfu, one of which states, "Now as for the Winged Disk which is on the shrines of all the gods and goddesses of Upper and Lower Egypt, and on their chapels likewise, it is Horus of Behdet."

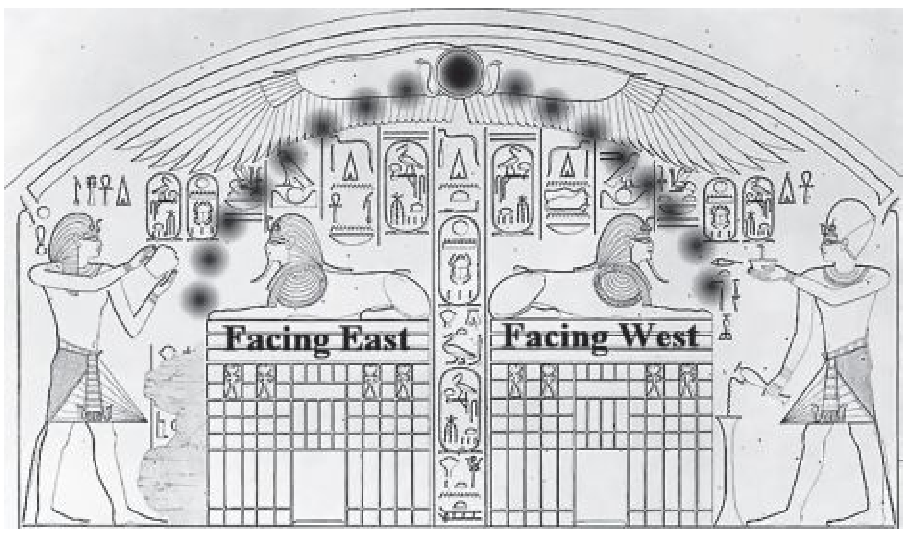


Fig. 5.3. The two sphinxes on the Dream Stela showing the diurnal path of the sun from east to west (sun disc added).

Fig. 5.4. A New Kingdom astro-theological drawing showing the twin or double-sphinx/lion called Aker with the solar boat on its back. Below is a mummy under the open sky, with the sun's path shown as dots or circles traveling from east to west.

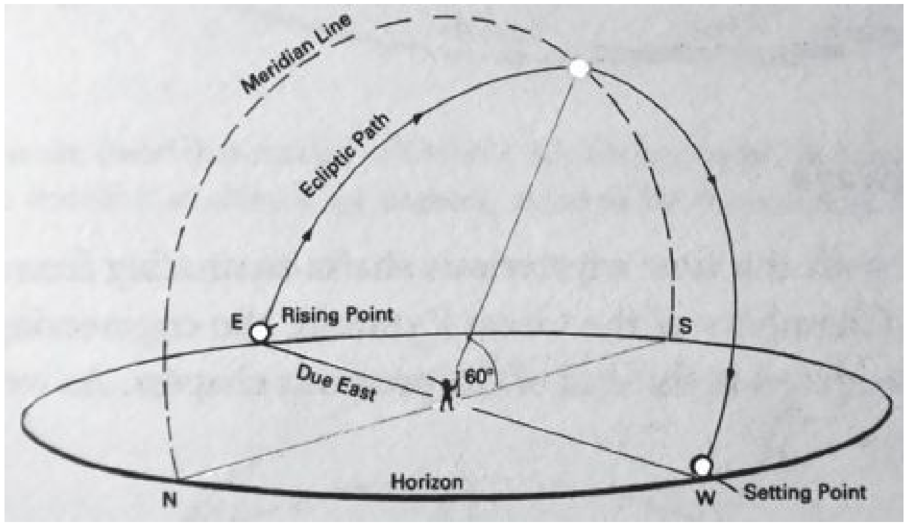


Fig. 5.5. The diurnal course of the sun from east to west. The midpoint of the daily journey is noon, with the sun at the south meridian. (Here the path is shown at the equinoxes.) (Image courtesy of R. Bauval.)

Perhaps the most dramatic and revealing example of Behdety is to be found on the pyramidion of Amenemhet III (Twelfth Dynasty). Here is seen the winged solar disc, and below it is an inscription evoking Horakhti as "Lord of the Horizon." There are two large eyes below the Behdety symbol that represent the "face" of the Horus-king, in this case Amenemhet III, supposedly gazing at Horakhti or Re-Horakhti in the eastern horizon. According to the British Egyptologist I. E. S. Edwards, "All four sides bear inscriptions in which are invoked deities associated with the geographical regions which the sides face. The first is the god of the rising sun, *Harakhte*, who is addressed in these words: "May the face [eyes] of the king be opened so that he may see the Lord of the Horizon (i.e. *Harakhte*) when he crosses the sky" (italics added) (Edwards 1993, 267). (Edwards transliterates Horakhti as Harakhte.)

Fig. 5.6. The pyramidion of Amenemhet III.
(Photo courtesy of R. Bauval.)

I am inclined to think that Edwards was wrong in assuming that the face with the depiction of the winged-sun disc (i.e., Horus of Behdet) was meant to face east. The text below the winged-sun disc clearly tells us that Horakhti, lord of the (two?) horizon(s), is seen when he "crosses the sky" (i.e., when the sun travels from east to west). Thus, this face of the pyramidion must therefore by necessity be meant to face *south.*

A BOOK OF "GENESIS" IN STONE

The Edfu Texts

Edfu—whose name in ancient times was Behdet—is a large modern town some one hundred kilometers north of Luxor. This is where the great Temple of Horus of Behdet is located. This spectacular temple, other than its imposing architecture and amazing state of preservation, is famous for the proliferation of hieroglyphic inscriptions found on its walls and columns, collectively known to Egyptologists as the Edfu Texts. The impression one often gets when strolling along the huge inner boundary walls of this temple is that it is, quite literally, a *book in stone.* The detailing and information of the inscriptions is stunning, as some even give the date of the construction of the temple as having started in 237 BCE and being completed in 142 BCE. These two dates, of course, bracket the so-called Ptolemaic period, when Egypt was ruled by Macedonian-Greek pharaohs after the death of Alexander the Great. However, there is a fair amount of archaeological evidence indicating that there was an older temple that had once stood on this very same site, and the inscriptions even mention a sort of "mythical temple" that was here in the golden age of *zep tepi* (the first time)! (Bauval and Brophy 2013, 126). We will recall from chapter 1 how it was said that all rituals and feasts in ancient Egypt that were performed at temple sites were "*a repetition of an event that took place at the beginning of the world*" in the epoch of zep tepi, that mysterious "First Time" which was "*a golden age of absolute perfection . . . known variously as 'the time of Re,' 'the time of Osiris,' or 'the time of Horus'*" (Clark 1958, 27, 263; italics added).

The inscriptions of the Edfu temple that are the most telling, however, are found on the external walls of the temple. These were studied in great detail by the Egyptologist Eve Reymond (1923–1986) of Manchester University. According to Reymond the inscriptions illustrate a "mythical history" on the origin of the temple in "the first occasion" (i.e., the primeval golden age of the gods, zep tepi). There are also inscriptions on the inner boundary wall of the temple that expound the so-called myth of Horus. These were first copied in 1870 by Egyptologist Eduard Naville and later studied and translated by Émile Gaston Chassinat as well as many other Egyptologists since then, notably Kurt Sethe, Hermann Junker, and, more recently, A. M. Blackman and H. W. Fairman. The most interesting part of the myth is the epic battle or war between Horus and Seth. According to Blackman and Fairman:

> The god of Edfu, Horus of Behdet, was in his original form a warrior-god as well as a divine-king, the stories of whose exploits rest ultimately on an historical basis. That basis, if we accept the theory expounded by [Kurt] Sethe in his Urgeschichte, is to be found in the wars waged in pre-dynastic times by the Horus-kings of Heliopolis, whose frontier town was Edfu, against the Seth-kings of Ombos and Southern Egypt. Under the influence of the Heliopolitan sun-cult Horus, the warrior-god of Edfu, was equated to Re or, more commonly was assigned the position of that god's son. Accordingly, the legends describing the conflict of Horus with his enemies was solarized, and these enemies became the enemies of Re or Re-Horakhti, and Horus of Behdet was represented as destroying them in order to protect the sun-god and uphold his authority. (Blackman and Fairman 1942, 32)

These texts, then, very much seem to be records, albeit highly mythologized, of historical events that occurred in predynastic times, and so important were these events that they were still remembered thousands of years later. And even though the narratives are in mythical terminology, symbolism, and metaphors typical of ancient Egyptian texts, they deal with what could be the real genesis of the Egyptian civilization. The apotheosis is an epic battle—more like a war—between Horus and Seth, leading to the appointing of Horus as king of all Egypt, symbolized by the placing on his head of the royal double-crown of Upper and Lower Egypt. At Edfu this was celebrated each year by the crowning of a falcon, probably a statue, on a very special day of the solar calendar, the first of Tybi. The Egyptologist Arno Egberts undertook a study of the various dates given in the text and concluded:

> The natural starting point for any discussion of the chronology of the Horus Myth is the regnal year mentioned at its very beginning: "Year 363 of the king of Lower and Upper Egypt Re-Horakhte living forever and ever." . . . It was on 1 Tybi [first day of the fifth month of the civil calendar] that the forces of chaos met their doom. . . . This was the *first occasion* [zep tepi] on which Horus, in his capacity as winged sun-disc, played havoc among the enemies of Re . . . in

> the surface structure of the Horus Myth, the rebellion and its first suppression by Horus the Behdetite are dated to 1 Tybi. Egyptologists with a penchant for numerology will be pleased to note that this is the 121st day of the Egyptian calendar, which is suggestive of a relation with the regnal year 363 (363 = 3 × 121).[*33] More important are the liturgical connections of 1 Tybi. In the festival calendar of the Temple of Edfu, this is the first day of the so-called Festival of the Sacred Falcon. Its major event was the coronation of a falcon, which symbolized the reigning king as well as the *primeval falcon* figuring in the cosmogony of Edfu. Besides the falcon, the winged-disc is an important feature of this cosmogony. Viewed from this angle, the Horus Myth acquires the characteristics of a creation myth. This impression is strengthened by the fact that the Egyptians regarded 1 Tybi as a second New Year's Day, which as such involved a renewal of the entire creation. (Egberts 1997, 48–51; italics added)

In the part of the Horus Myth texts known as "The Legend of the Winged Disc," it is also made clear that Horus of Behdet is the son of Re-Horakhti: "Year 363 of the King of Upper and Lower Egypt, Re-Horakhti, may he live for ever and ever. . . . Horus of Behdet was in the barque of Re, and he said to his father Re-Horakhti: 'I see enemies who plot against their mighty lord. May the [. . .] of thy uraeus [the cobras around the solar-disc] prevail against them.' The majesty of Re-Horakhti said: 'As thou desirest, O Horus of Behdet, thou son of Re, exalted one who camest forth from me'" (Fairman 1935, 26–36).

Note that in the above text we are to understand that Re and Re-Horakhti are one and the same entity and, furthermore, are considered to be the father of Horus of Behdet. The whole battle has an intense solar symbolism, with Horus of Behdet in the role of the sun disc who attacks the enemies of the sun god Re-Horakhti. This battle, as Junker and Sethe have suggested, could be a mythologized account of a major historical battle in which a Horus-king from Heliopolis in Lower Egypt was victorious over a Seth-king from Ombos in Upper Egypt. The result of this victory was the crowning of Horus as king of Lower and Upper Egypt. All kings of Egypt believed themselves to be reincarnations of the original Horus-king, and, in this respect, we would expect some early Horus-king to have been inspired to build a great "solar temple" as a memorial to the epic battle, at which could be performed celebrations and royal rituals each year on 1 Tybi in commemoration of the great victory as well as the "unification of the two kingdoms." Here, too, might have taken place the coronations of Horuskings. We shall soon see how the Giza necropolis, or a large portion of it that includes the Sphinx, may indeed be such a complex to serve these important royal celebrations.

Meanwhile, and as Egberts astutely pointed out, 1 Tybi was the 121st day of the Egyptian calendar. It is widely known that the ancient Egyptian civil calendar had fixed the first day of the year on the summer solstice—the twenty-first of June in our Gregorian calendar—which coincided with the beginning of the Inundation season (Bauval 2010, 49). This civil or solar calendar of Egypt had twelve months of thirty days plus five days added at the end, known as the epagomenal days, or "days upon the year" (Raven 1997, 275). Counting 121 days from the summer solstice would bring us to the first day of the fifth month, called Tybi. The position of the rising sun on this special day would be at azimuth 104º (14º south of east), as seen from the Giza necropolis. This astronomical bearing immediately set off alarm bells in my research!

THE CROSS-QUARTER OF THE SOLAR YEAR

Imagine yourself at dawn standing at the entrance of the so-called Mortuary Temple of Khafre 121 days after the summer solstice, that is, on the first of Tybi (corresponding to October 19 of our modern Gregorian calendar). Now imagine yourself looking eastward toward the Great Sphinx. As the sun rises over the distant low range of hills (the Mokattam Formation), you will immediately realize that you are looking along the direction of the causeway that leads to the Valley Temple. In fact, this leads you right to the western entrance of this temple. This cannot be taken so readily as a fluke because the whole symbolism of the Sphinx and its temples is intensely "solar," and, with the Sphinx itself, the whole symbolism evokes Horus/Horakhti (i.e., Horus of the Horizon). As we shall see in chapter 6, we will show that zep tepi can be dated to circa 10,500 BCE, and if you were to see the stars at that epoch that were in direct alignment with the Sphinx on 1 Tybi, you would see the constellation of the lion, Leo, half risen, with only the head and shoulders above the horizon line, exactly the same way that the Great Sphinx is seen, with only head and shoulders above the ground line of Giza.

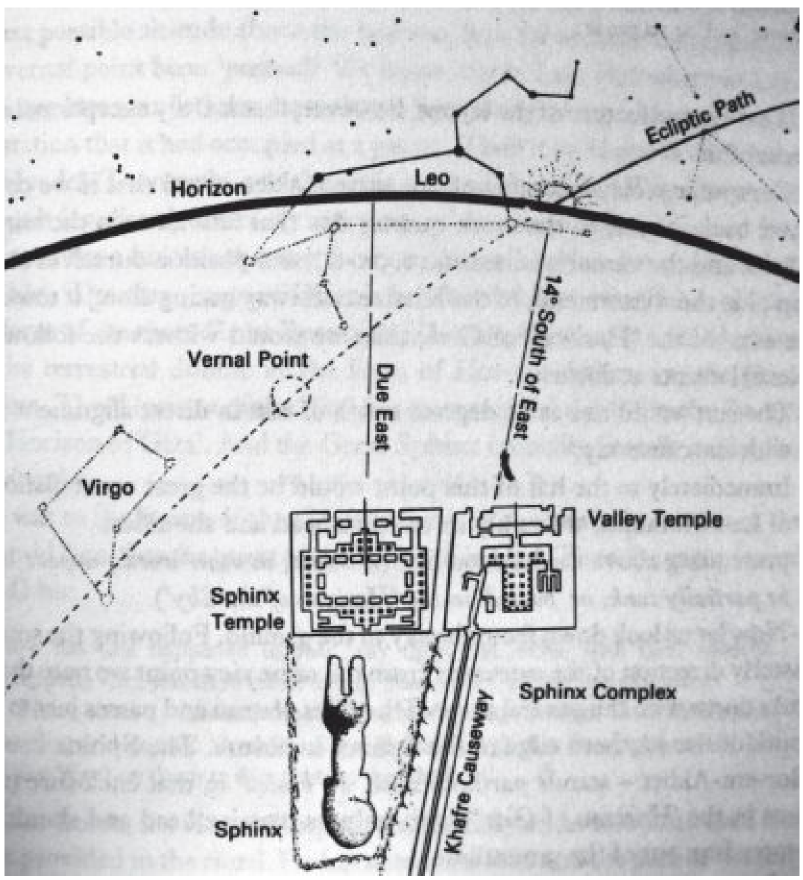


Fig. 5.7. The sunrise at zep tepi epoch on 1 Tybi. The celestial "sphinx" has only its head and upper body visible above the horizon (Horus of the Horizon?). (Image courtesy of R. Bauval.)

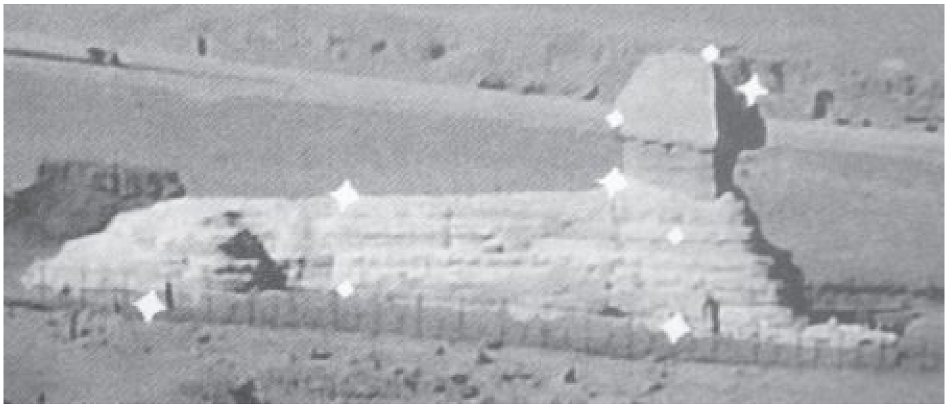


Fig. 5.8. The Great Sphinx as seen from the south, with head and only upper body visible above the "horizon" (Horus in the Horizon?), with the locations of the constellation's stars indicated. (Photo courtesy of Andrew Collins.)

HORUS, SON OF ISIS

There is another important event in the myth of Horus, one that earmarks the date of 7 Tybi. We are told in the text that after the great battle on 1 Tybi, when Horus of Behdet destroyed the army of Seth, the latter and his gang fled northward while changing themselves into hippopotamuses and crocodiles. They were then captured and incarcerated on 7 Tybi by Horus of Behdet, assisted by Horus, son of Isis.

> Horus of Behdet sailed downstream in this barque of Re together with the great god. . . . He sailed after them (the enemies) very rapidly. . . . Then Horus of Behdet and Horus son of Isis slew that craven foe and his confederates and those enemies when he reached them [in] the western waters of this town. . . . They slew the enemy together on the west of Pr-rhhwy on the edge of the water. . . . *Now all these things took place on Tybi 7. . . . Tybi 7 shall be called "Festival of Navigation" until this present day*. (italics added)

The term "until this present day" refers, of course, to the time when the temple of Edfu was under construction, between 237 BCE and 142 BCE. These dates bracket the reigns of Ptolemy III to Ptolemy VIII, both of whom had ruled Egypt from the coastal city of Alexandria, where the tutelary deity was the goddess Isis. In the first century CE the Greek historian Plutarch wrote the story of Isis and Osiris for the lady Clea, a priestess of Dionysus at the temple at Delphi in Greece. Plutarch was obviously aware of the meaning of 7 Tybi, but nonetheless created a variation to the Festival of Navigation involving not Horus, son of Isis, but Isis herself. "By the hippopotamus they represent Typhon [i.e., Seth], and by the falcon [they represent] power and sovereignty. . . . For this reason, when they [the Egyptians] sacrifice on *the 7th of the month of Tybi,* which they call the 'Arrival [by Boat] of Isis from Phoenicia,' they stamp on round sacrificial cakes the figure of a tied-up hippopotamus . . . it is [also] customary for everyone . . . to eat a crocodile . . . and they say [in explanation] that when Typhon was running away from Horus, he changed into a crocodile" (italics/emphasis added) (Plutarch, § 83).

Fig. 5.9. Horus of Behdet slaying/harpooning Seth in the form of a hippopotamus.

It is thus possible that a second battle was introduced in the original myth of Horus in order to legitimize "Horus, son of Isis," also as king. This is implied in the Edfu Texts themselves: "Horus of Behdet was like a man of proved valor, with the head of a falcon, crowned with the white crown, the red crown and the double plumes, with the two uraei on his head, his back being that of a falcon, and his spear and rope being in his hands. Horus son of Isis transformed himself after the same manner that Horus of Behdet had assumed before him."

THE JUBILEE OF THE HORUS-KINGS

The important solar date of the first of Tybi was also used for the so-called *heb-sed,* or Jubilee festival. This entailed various elaborate symbolic tests and trials to ascertain the physical and mental fitness of the king so that a new lease to rule Egypt could be granted to him (Kelly 2005, 268; Bauval 2010, 154–81). During the heb-sed the pharaoh was probably ceremonially recrowned with the royal double-crown of Upper and Lower Egypt, probably to reenact the coronation of the primeval Horus after his victory over Seth in zep tepi.

As we have noted, the astronomical alignment of the causeway linking the Mortuary Temple with the

Valley Temple of Khafre is 14º south of east (azimuth 104º), which points to the sunrise that takes place exactly 121 days after the summer solstice. This, in the civil calendar, was the first of Tybi. In my opinion this cannot be a coincidence, but rather strongly suggests that the Mortuary and Valley Temples as well as the causeway and the Great Sphinx formed one unit, a sort of "solar complex" where ceremonies and rituals of kingship could take place at specific days of the solar year—a sort of Westminster Cathedral of the pharaonic age.

Egyptologists readily admit that the Sphinx and its temples have strong solar connotations, but also that they stand out from the typical religious architecture of ancient Egypt. This is made obvious by their strange layout, their astronomical symbolism, and, most noticeably, their massive megalithic construction. The Great Sphinx is unquestionably the largest carved monolith in Egypt, and its temples have limestone blocks ranging from fifty to two hundred tons, something not seen anywhere else in Egypt. All these unique factors should induce us to consider these edifices as a unit detached from the rest of the Giza necropolis—something that we will do in chapters 6 and 7.

Fig. 5.10. The possible "solar complex" at Giza. (Image courtesy of R. Bauval.)

THE ZENITH OF THE SUN GOD

The Dream Stela narrates how, as a young prince, Tuthmoses IV fell asleep under the shadow of the Great

Sphinx when the sun was at its zenith (i.e., at noon): "A vision of sleep seized him [Tuthmoses] at the hour when the sun was at its zenith."

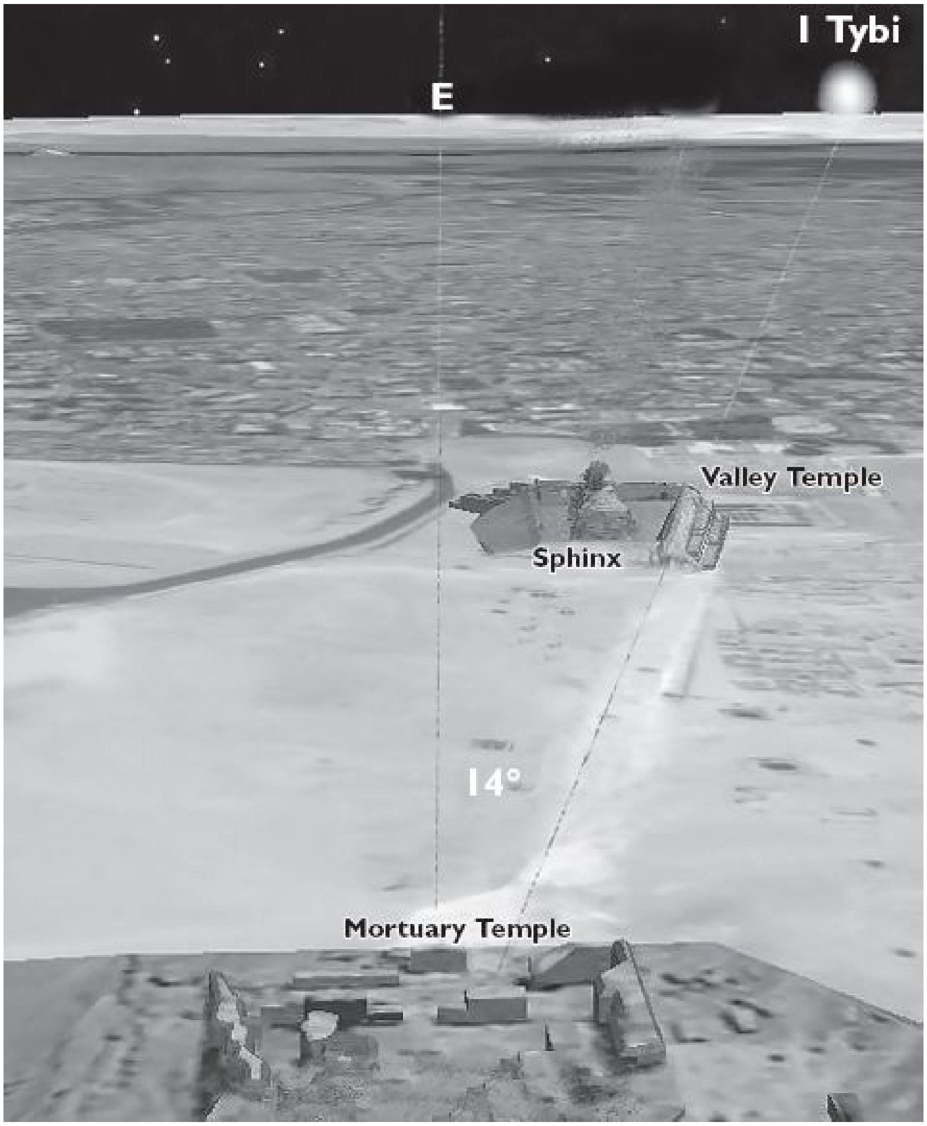


Fig. 5.11. The possible "solar complex" seen from a different perspective, looking east toward the rising sun in the "first time" setting. (Image courtesy R. Bauval.)

This is also visually depicted, as we have previously noted, on the stela by a winged solar disc, the symbol of Horus of Behdet, that is seen hovering above the two sphinxes. While in his sleep Tuthmoses heard the Sphinx say, "I am your Father, Horemakhet-Khepri-Re-Atum, who will give to you my kingdom on Earth at the head of the Living.

The "father," that is, the Sphinx, is named on the stela with all the forms of the sun god, including Horakhti, as made evident by Tuthmoses IV being called the "Protector of Horakhti, living image of the Sphinx, begotten of Re . . . beautiful of face like his father, who comes forth . . . equipped with the form of Horus upon him." Anyone who has seen a falcon in free flight and swooping down at breakneck speed toward an earthbound prey would surely have been impressed with this magnificent bird, the "F-16" of the avian creatures. The stunning accuracy and speed of the falcon's dive, as well as the ferocity with which it attacks its unsuspecting victim, makes it a perfect symbol for warrior-chieftains such as the Horus-kings. But why was the falcon also seen as a *solar deity?* The explanation is probably to be found in the behavior of the Egyptian falcon at dawn. I had the good fortune on many occasions to be at the oracle temple of the sun god Amun-Re in the Oasis of Siwa at dawn to witness the stunning display of falcons at the moment of sunrise. These spectacular birds appear as if from nowhere and hover over the temple, then shoot toward the golden disc of the sun. With the rays of the sun shimmering around their feathers, the falcons suddenly stop in midair with wings spread out and, for a few seconds, afford to the lucky spectator one of the most dramatic and inspiring sights that can be experienced at dawn. Everything else is diminished, even the sun disc itself, with the dazzling display of these "golden falcons." It is then that the name Horakhti, Horus of the Horizon, takes on a very special meaning.

THE PRIMORDIAL FALCON

The falcon god Horus was one of the earliest, if not *the* earliest, solar deities of ancient Egypt.[*34] The early dynasties—and perhaps even the protodynasties—used the falcon as the symbol of kingship. This is evident from the "Horus name" in the titles of early kings, which, incidentally, is a practice that endured throughout the whole pharaonic era. The Horus name is normally shown inside a *serekh*, a sort of rectangular sign symbolizing the facade of the royal palace with a falcon perched on it.

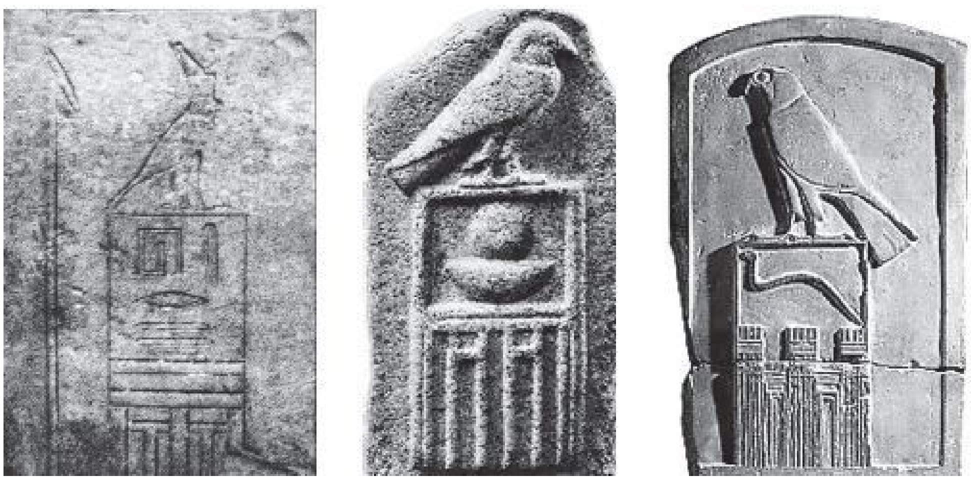


Fig. 5.12. Various serekhs with the Horus names of kings.
(Photos courtesy of R. Bauval.)

But how or why did the primeval falcon god, Horus or Horakhti, also acquire a leonine form? The best explanation is given by Egyptian Egyptologist Selim Hassan. After a protracted discussion of how and why the lion was an important royal symbol in prehistoric times, Hassan concluded:

> Then came an occasion when the Egyptians wished to create an imposing image for their God-king, who after his death was called Horakhty, the Lord of Heaven. How to represent him? They had been long familiar with the solar falcon, but desired some finer representation, as the King, though identified with Horus and Horakhty, was never represented in the same manner as these gods, namely in the form of a hawk-headed man. The idea of using the form of the Lion God . . . probably occurred first, but it was not the ideal representation, for the lion had become associated in their minds with ferocity as well as kingship, and they wished to represent a wise and powerful but beneficent deity. It is perhaps in this manner that they evolved the idea of the Sphinx, which displays on one form the grace and terrific power of the

> lion and the superior intellectual power of a man, and at the same time, may be made as a portrait of the reigning king. . . . In late times the God Horakhty appeared in several forms. He could be represented as a sphinx with the head of a hawk [falcon], or with a human head, as a hawk-headed man, or as a simple hawk, and many representations of him occur upon our stelae showing him in these guises. It will be seen that in each case the hawk-like nature of the god is more or less prominently expressed, and this is the clue which leads us to the heart of the mystery. First, in the dawn of Egyptian history the hawk [falcon] was the symbol of the Great God of the Western Delta Kingdom, whose two eyes were the sun and the moon. When the rule of the Delta kings expanded, and they made Heliopolis their capital; the priests of that city, who had hitherto worshipped the solar disk, mingled the two faiths together for political purposes, and represented the god as a man with the head of a hawk, and crowned with the solar disk; and they called him either Ra-Horus or Horakhty. In the beliefs of the Egyptians, the king was the earthly representation of this god, and we have material proof that the dead king especially was called Horakhty, for the name appears in this sense in the Pyramid Texts. (Hassan 1993, 147, 233)

We fully agree with Hassan's explanation. Indeed, the best way to regard the Great Sphinx is as the quintessential solar deity of Egypt, Horakhti, Horus of the Horizon in his leonine form. The assimilation of Horakhti to other solar deities such as Atum, Re, and Khepri did not alter his leonine iconography but rather emphasized his solar identity. Of the fifty-one votive stelae dedicated to the Great Sphinx that Hassan found at Giza, nineteen were far too damaged for the inscriptions to be read, leaving thirty-two that depict and name the Great Sphinx. Five of these use solely the name Horakhti, two others use solely the name Re-Horakhti, and about ten use Horakhti and other solar names. The name of Horakhti is also seen next to a depiction of the Great Sphinx on the limestone doorpost of the temple of Amenhotep II next to the Great Sphinx, with the caption, "He [the king] made it as his monument for his Father, Horakhti" (Hassan 1993, 234).

As for the name Horemakhet, Horus in the Horizon, I believe it was specifically and exclusively used, and only from the Eighteenth Dynasty onward, for the *actual statue* of the Great Sphinx and served as a sort of literary device to differentiate the physical Sphinx from its cosmic counterpart in the eastern horizon, which was called Horakhti, Horus of the Horizon. Once this is appreciated, then it becomes clear why some votive stelae refer to the Great Sphinx Horakhti while others name it Horemakhet and yet still others use both these names. It also explains why there are two sphinxes on the stelae of Amenhotep II, Tuthmoses IV, and Rameses II, one facing east and the other facing west. All this is well and good, but what in the sky could have represented Horakhti? Was there a celestial image that can be regarded as a couchant lion? And if so, when and where was it observed?

SUNRISE, LOOKING EAST AT THE TIME OF INUNDATION

The Inventory Stela ends its narrative with a comment about the Great Sphinx, here called "Horus in the Horizon," that gives an important clue: "May he [the Sphinx] endure. . . . May he live forever and ever, his face turned toward the east."

The face of the Great Sphinx is not just "turned toward the east," but, to be more precise, it is turned toward *cardinal* east or, in astronomical jargon, due east (at azimuth 90º). In other words, the Sphinx was deliberately made to gaze at the sunrise at the equinoxes as long as it would exist. Now, there are two equinoxes each year: the vernal (spring) equinox on March 20 and the autumnal (fall) equinox on September 22. But which of the two equinoxes was the Sphinx intended to mark . . . and when?

Standing in an open space such as in a flat desert region, the Earth appears to be a huge circle with the observer at its center. In the land of Egypt, the River Nile bisects this circle from south to north. The source of the Nile, and thus for the ancient Egyptians the source of all life, lies somewhere in the far distant south beyond the horizon, which is also the direction that the sun reaches its highest altitude every day, which is technically known as the "culmination" (also erroneously known as "zenith").[*35]

It was therefore quite natural for the Nile dwellers in Egypt to direct themselves southward, the direction in which the sun travels from east to west. When facing south, the east is to the left and the west is to the right. Indeed, in ancient Egypt the word *east* was the same as "left" and the word *west* the same as the word "right." Furthermore, the south was perceived as "up," and even today the modern Egyptians refer to southern Egypt as "Upper Egypt" and northern Egypt as "Lower Egypt."[†36]

The altitude of the sun at culmination is not the same each day, but changes from a maximum altitude at summer solstice (June 21) to a minimum altitude at winter solstice (December 21). Seen from Giza, the maximum altitude is 84º and the minimum altitude is 36º (measured from the south horizon). I am convinced that since prehistoric times the Nile dwellers of Egypt noticed that when the sun was at maximum altitude (i.e., at summer solstice), the water level of the Nile would begin to rise to signal the start of the Inundation season.

It is difficult today to imagine the superlative importance that the Inundation of the Nile had for the ancient Egyptians. Their welfare, sometimes even their very survival, depended on it. It is a fact that without the Nile, Egypt could not have existed, and without the Inundation, the people and fauna would have suffered famine and destitution. This yearly hydraulic miracle of nature brought waters from Central Africa and the highlands of Ethiopia laden with fecund alluvial material and nutrients, which flooded the adjacent valley and irrigated and fertilized the crops. It was a great boon from the gods, and the pharaoh being the mediator with the gods was responsible to ensure that all was done in Egypt in strict accordance to divine law—ceremonies, rituals, and sacrifices at temples—so that a "good" Inundation would be granted to Egypt each year. There was, however, a constant fear among the populace that too low an Inundation would bring famine and one too high would cause destruction and havoc.

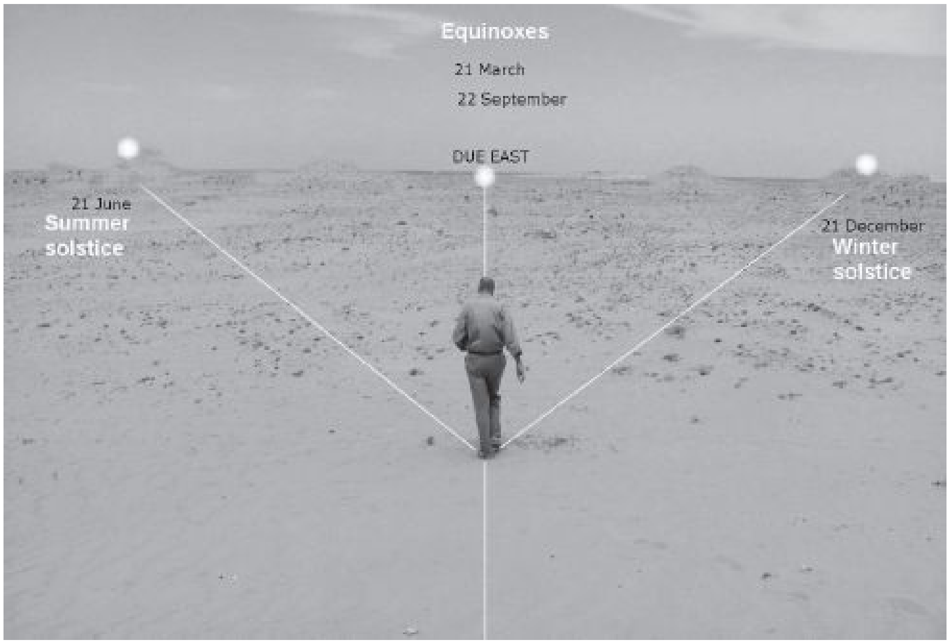


Fig. 5.13. The position of sunrise at the two solstices and two equinoxes. (Photo courtesy of R. Bauval.)

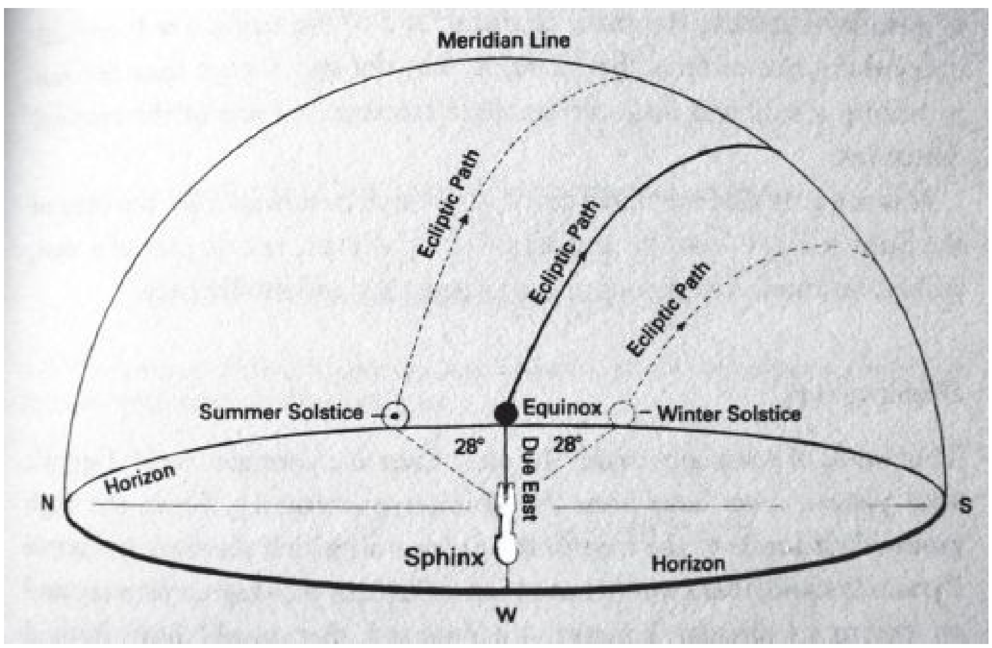


Fig. 5.14. The Great Sphinx directed due east at equinox. (Image courtesy of R. Bauval.)

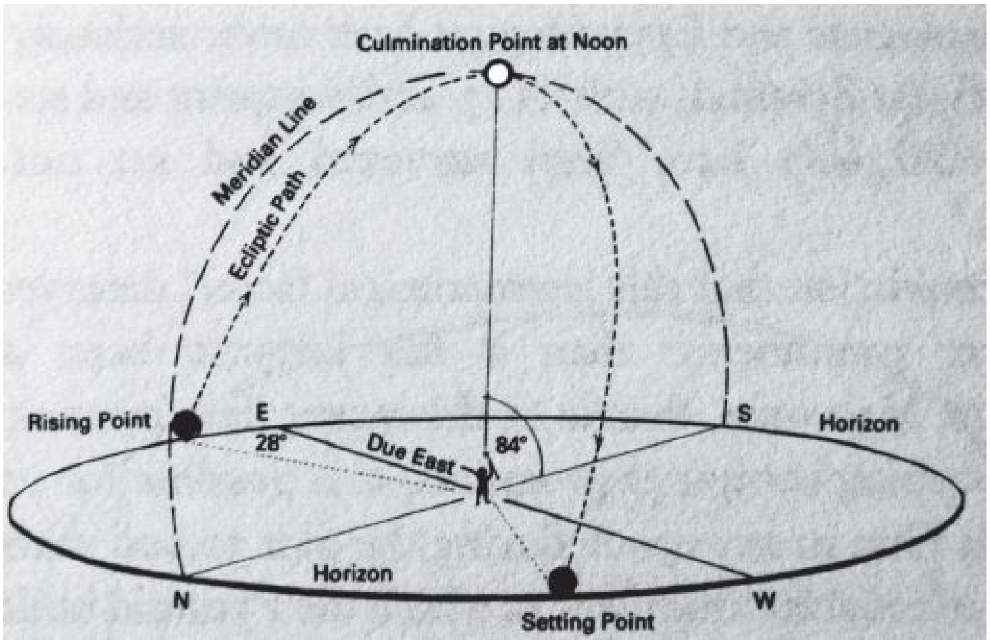


Fig. 5.15. Highest culmination of the sun at summer solstice, latitude of Cairo. (Image courtesy of R. Bauval.)

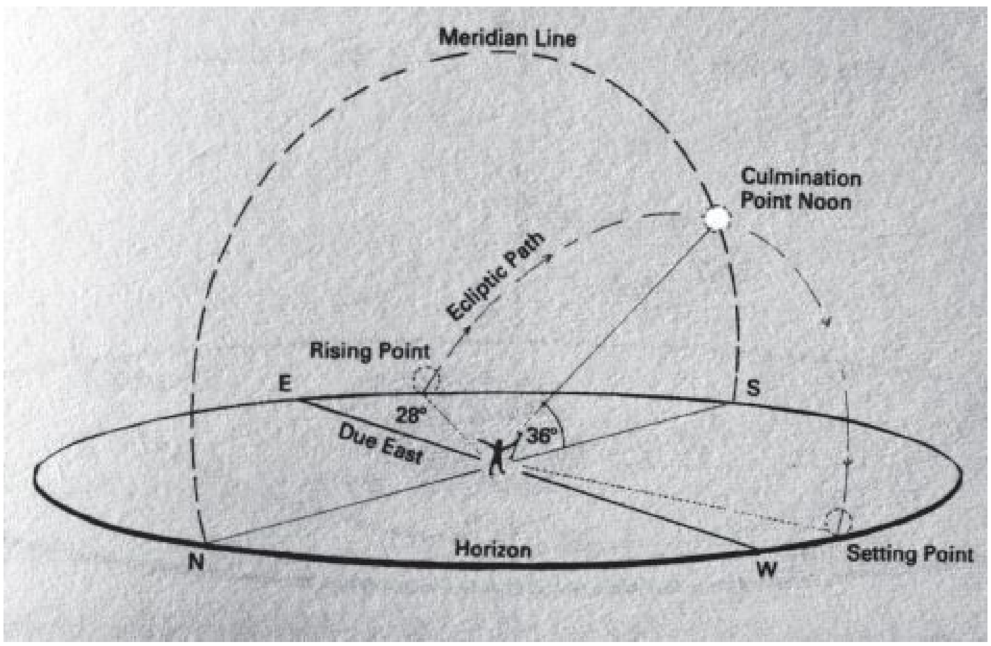


Fig. 5.16. Lowest culmination of the sun at winter solstice, latitude of Cairo. (Image courtesy of R. Bauval.)

TYING THE KNOT

The god of the Nile Inundation was Hapi. He was generally depicted as a flabby man with pendant breasts and a potbelly, and wearing a headdress made of aquatic plants, of three papyrus stems to represent the north, or, at other times, three lotus stems to represent the south. Hapi was Egypt's equivalent of the Roman *cornucopia*, or "horn of plenty and abundance."[*37] In the New Kingdom, Hapi was often shown in a pair: Hapi of the north and Hapi of the south, who tied a knot with the long stems of a papyrus and a lotus plant, an act symbolizing the unity of Upper and Lower Egypt (i.e., the "two kingdoms").

Egyptology textbooks tend to treat Hapi as a minor deity. For example, in his opus *Kingship and the*

Gods, Henri Frankfort mentions Hapi only once (Frankfort 1978, 185). Similarly, Paul Jordan in his book on the Sphinx barely gave Hapi any attention (Jordan 1998, 180). And I. E. S. Edwards, Mark Lehner, and Zahi Hawass totally ignore Hapi in their books on the pyramids and the Sphinx! (Edwards 1993; Lehner 1997; Hawass 2006). This has given to the lay reader the erroneous impression that the Nile or the Inundation had nothing or very little to do with the Giza monuments and, more specifically, the Great Sphinx. On the other hand, in all my books on ancient Egypt, especially *Black Genesis*: *The Prehistoric Origins of Ancient Egypt* (Bauval and Brophy 2011), I argued that in order to understand the deeper metaphysical and religious state of mind of the ancient Egyptians, and especially the pyramid builders, as to why they had very early developed a sky religion centered on rebirth and the stars, and finally why they resorted to building pyramids and temples to service their rejuvenation and rebirth rituals, one has to appreciate the tremendous psychological effect the Nile Inundation had on them and how it made them think in dualistic terms: as above, so below.

Fig. 5.17. The god Hapi on the left, representing Upper Egypt with the lotus plant, and also on the right, representing Lower Egypt with the papyrus plant, in an act of symbolically binding or unifying the two kingdoms. (Luxor Temple.) (Photo courtesy of R. Bauval.)

FROM HELL TO PARADISE

Deep in prehistory the climatic conditions of Egypt were very different. The breaking of the last ice age around 10,500 BCE caused supermonsoons in Central Africa and the highlands of Ethiopia, resulting in the gorging of the huge lakes that we know today as being the source of the Nile. The overflow of water from these lakes in turn caused torrential floods that rushed downstream to eventually reach the Egyptian Nile Valley, turning it into a huge and infested swampland totally unsuitable for human habitation. In contrast with this hostile environment, the adjacent Sahara was a lush and very inviting place, watered by the yearly monsoon rains and with plenty of game, and thus ideal for human habitation. In such congenial and favorable conditions, the Saharan people learned to domesticate cattle, developed a basic agriculture, and set the foundation of a complex society. The cyclical monsoon rains and the need to predict their arrival also prompted these prehistoric people to develop timekeeping using the stars, which, in turn, served as the embryonic stage of a sky religion involving rituals in simple ceremonial settings and the development of ornate burials using stones (Bauval and Brophy 2011, 9–18). By the sixth millennium BCE, however, the climatic conditions were in complete reverse, due to a warmer and dryer phase. The Inundations became less severe and more regular, turning the hostile swampland in Egypt into a lush, fertile, and quasi-paradisiacal river valley, which today we call the Nile Valley. On the other hand, the monsoon rains stopped reaching the Sahara, causing the region to turn into an arid, lifeless desert unfit for human existence. This resulted in a migration, a sort of prehistoric exodus, of the prehistoric people from the Sahara into the Nile Valley, bringing with them the seed of civilization.

The seasonal life-giving water that had “fallen from the sky” (i.e., the monsoon rainfall that drenched the Sahara from June to September) was now replaced by the seasonal Inundation of the Nile Valley, also during the same months of the year. And yet there is evidence that the perceived “celestial” origin of the Inundation was never forgotten. The “Hymn to the Aten,” composed by the ill-fated pharaoh Akhenaten, the son and successor of Amenhotep III and father of Tutankhamun, seems to bear testimony to this belief.

> Thou [Aten] makest a Nile in the Duat [the underworld], thou bringest forth [the Inundation] as thou desirest to maintain the people [of Egypt] . . . thou hast set a Nile in heaven [rainfall] that it may descend for them [the foreigners in the distant south] and make waves upon the mountains [waterfalls], like the great green sea, to water their fields in their towns. How effective they are, thy plans, O lord of eternity! The Nile in heaven [rainfall] is for the foreign peoples and for the beasts of every desert. . . . (While the true) Nile comes from the Duat [underworld] for Egypt. (Pritchard 1958, 227–30)

There is also an earlier “Hymn to the Inundation,” that is, “Hymn to Hapi,” from the Middle Kingdom (ca. 2100 BCE), which was extensively recopied in the New Kingdom on papyrus documents. An excerpt of this hymn reveals the same idea of a celestial Nile as being the source of the Inundation: “Hail Inundation [Hapi]! Emerging from the earth, arriving to bring Egypt to life, hidden of form, the darkness in the day, the one whose followers sing to him, as he waters the plants, created by Ra to make every herd live, who satisfies the desert hills removed from the water, for it is his due [path] *that descends from the sky. . . . While he is in the Duat, sky and earth are in his charge*” (italics added).

THE CELESTIAL NILE

It is tempting to see the celestial Nile imagined by the ancients as the shimmering band of light we call the Milky Way. The astronomer Virginia Lee Davis of Yale University, when reviewing the passages in the Pyramid Texts that speak of the “crossing” of the sun god and his retinue, commented, “What they cross is a waterway. It is a very prominent waterway . . . surely it must be the Milky Way" (Davis 1985, S102). In a similar vein the Canadian Egyptologist Samuel Mercer, a translator of the Pyramid Texts, provided a more vivid picture when he wrote, "The *Duat* was a kind of duplicate of Egypt . . . and it had a great river running through it on which went on it the boat of the sun-god" (italics added) (Mercer 1949, 331). Raymond Faulkner, the acclaimed philologist and translator of the Pyramid Texts and other religious literature of ancient Egypt, introduced spell 99 of the Book of the Dead with these words: "This Spell is concerned with the provision of a boat for the deceased to cross the celestial river, equated by the Egyptians with the Milky Way" (Faulkner 1990, 90). More recently Paul Jordan wrote, "The sky they sometimes thought to possess the same topography as the earth below, with a celestial river of its own. In the night sky, the Milky way constituted an obvious parallel to the Nile on earth" (Jordan 1998, 180).

It is well known that the ancient Egyptians perceived the west as the "land of the dead" and the east as the "land of the living." In royal burials the dead king was transported on a boat across the Nile to a harbor on the west bank, at which point he was now deemed to have reached "the doors of heaven," that is, the entrance to the afterworld/ duat (Brovarski 1977, 110). The boat journey of the departed pharaoh across the sacred river toward the entrance of the necropolis was, therefore, westward. Yet spell 90 confirms that the imaginary boat journey of the "soul" of the dead is toward the *eastern* horizon, the place of sunrise. At the start of the journey on the west bank of the river, the deceased is questioned by the celestial ferryman, called Mahaf:

> Do you say that you would cross to the eastern side of the sky? If you cross, what will you do?

The deceased replies to this and several other questions, at the end of which the deceased expressed the wish to join "the Great God" who

> reveals himself in the eastern horizon of the sky, he travels in the western horizon of the sky . . . when He departs, I will depart; when he hales, I will hale [become alive]. . . . You [the ferryman] shall not repel me from the Milky Way!

The boat journey, which transports the mummy of the deceased across the Nile to the necropolis, is from east to west. But then this same journey, however, is also imagined to be *mirrored in the sky,* taking place in the opposite direction from *west to east across the Milky Way* in order to reach the place of sunrise. In chapter 6 we will show how this "crossing" was imagined to take place during the Inundation season when the water of the Nile reached the Giza plain. This was when the "doors of heaven" (i.e., the entrance to the necropolis) opened. In other words, the Inundation created the physical setting for the "crossing" of the earthly river (i.e., the Nile), while at this same time of year it was also seen in the sky with the crossing of the Milky Way by the sun.

HAPI ON THE ROYAL THRONE

The supreme importance of Hapi is further evident by his depiction on the royal throne, where papyrus and the lotus reeds flank each side of the throne, binding it and thus providing support,[*38] serving, as it were, as the royal crest or coat of arms of the pharaonic kingdom.

Fig. 5.18. Throne of the god Atum. (Luxor Museum.)
(Photo courtesy of R. Bauval.)

Fig. 5.19. Throne of Amenhotep III (left; Colossi of Memnon), throne of Rameses II (right; Abu Simbel).
(Photos courtesy of R. Bauval.)

Fig. 5.20. Leo and Aquarius (Hapi) in opposition.

We have seen how on the Round Zodiac of Dendera, Hapi denotes the zodiacal sign of Aquarius and how this sign is in direct opposition to the zodiacal sign of Leo, the lion. This would mean that when Aquarius was seen setting on the western horizon, Leo was seen at the same time rising in the eastern horizon, or, alternatively, when Leo was seen setting in the western horizon, Aquarius was seen at the same time rising in the eastern horizon. The sign of Aquarius—the Water Bearer—in the various Egyptian zodiacs of the Late Period and Greco-Roman period, shows Hapi pouring water from a vessel, with Leo in direct opposition, the latter shown as a lion on a sky-boat—a scene strangely almost similar to the one depicted on the Dream Stela, which shows Tuthmoses IV pouring water from a vessel with the Great Sphinx (Leo?) "in opposition" (see figure 5.21).

Could the Dream Stela be depicting an "astrological" scene that symbolizes the Nile Inundation, with the appearance of Aquarius and Leo on the western and eastern horizons respectively? Is Tuthmoses IV representing Aquarius (i.e., the celestial or divine Water Bearer)? As far as Egyptologists are concerned, however, these are pointless questions because they are adamant that the zodiac was not known in the New Kingdom and that it was only "introduced" in Egypt in the fourth century BCE by the Greeks.

But what if they are wrong?

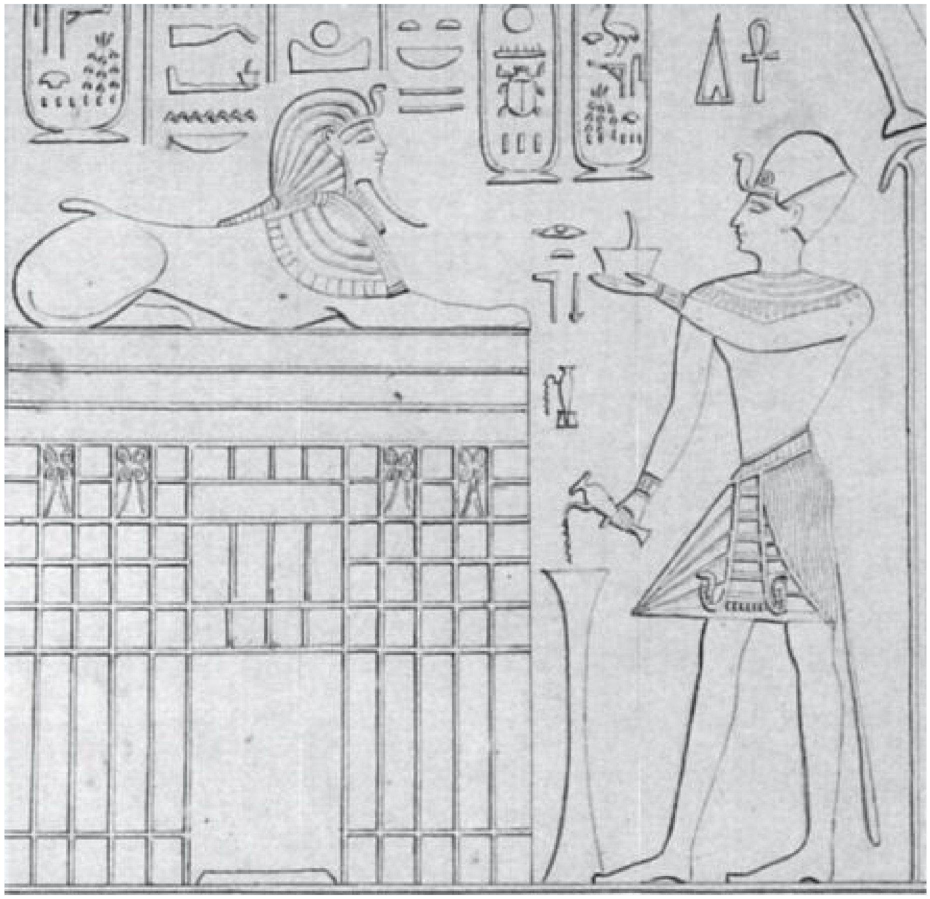


Fig. 5.21. Sphinx and Tuthmoses IV in opposition (Dream Stela).

THE RUSSIAN AND THE QUARTET

In the 1990s the eminent Russian astronomer Alex Gurshtein, Ph.D., onetime president of the International Astronomy Union Commission on the History of Astronomy, undertook an extensive study on the origins of the zodiac. Gurshtein arrived at the intriguing conclusion that the ancient Egyptians not only knew and tracked four principal zodiacal constellations denoting the two solstices and the two equinoxes (which he called the Quartet of Ecliptic Constellations), but also that *the Giza necropolis somehow* "*commemorated the origins of the zodiac*." Gurshtein presented his findings to the Russian Academy of Sciences in a paper titled "The Great Pyramids of Egypt as Sanctuaries Commemorating the Origin of the Zodiac: An Analysis of Astronomical Evidence" (Gurshtein 1996, 331–35). In brief, Gurshtein proposed that before the classical Babylonian twelve-signs zodiac was introduced in Egypt, the ancient Egyptians used a four-signs zodiac with the constellations that marked the two solstices and the two equinoxes—the Quartet. The Quartet constellations can be imagined forming a giant cross at the time of the equinoxes such that the two equinoxes define the latitude (i.e., east-west line) and the two solstices define the longitude (i.e., north-south line). According to Gurshtein the alignments and symbolism of the Giza necropolis were made during the Taurus Quartet, which he dated from 5600 BCE to 2700 BCE, and which comprised the zodiacal constellations of Taurus and Scorpio for the two equinoxes and Leo and Aquarius for the two solstices. In astrology this is the Age of Taurus, when this zodiacal constellation housed the sun at the vernal/spring equinox. Gurshtein concluded his thesis with this bold statement, "According to my conclusion the Great Sphinx is a symbolical image for two constellations: Leo (summer) and Aquarius (winter)" (Gurshtein 1999).

Through time, however, the apparent displacement brought about by the precession of the equinoxes will cause the zodiacal belt to slowly rotate counterclockwise such that each of the twelve zodiacal signs will house the sun at the vernal equinox for an average of about 2,160 years, assuming, of course that the ecliptic/zodiacal belt is divided into twelve equal parts and thus that all the twelve zodiacal constellations occupy equal parts.[*39] According to astrological reckonings the ages or quartets would be (assuming an average of 30° angular distance or size for each sign):

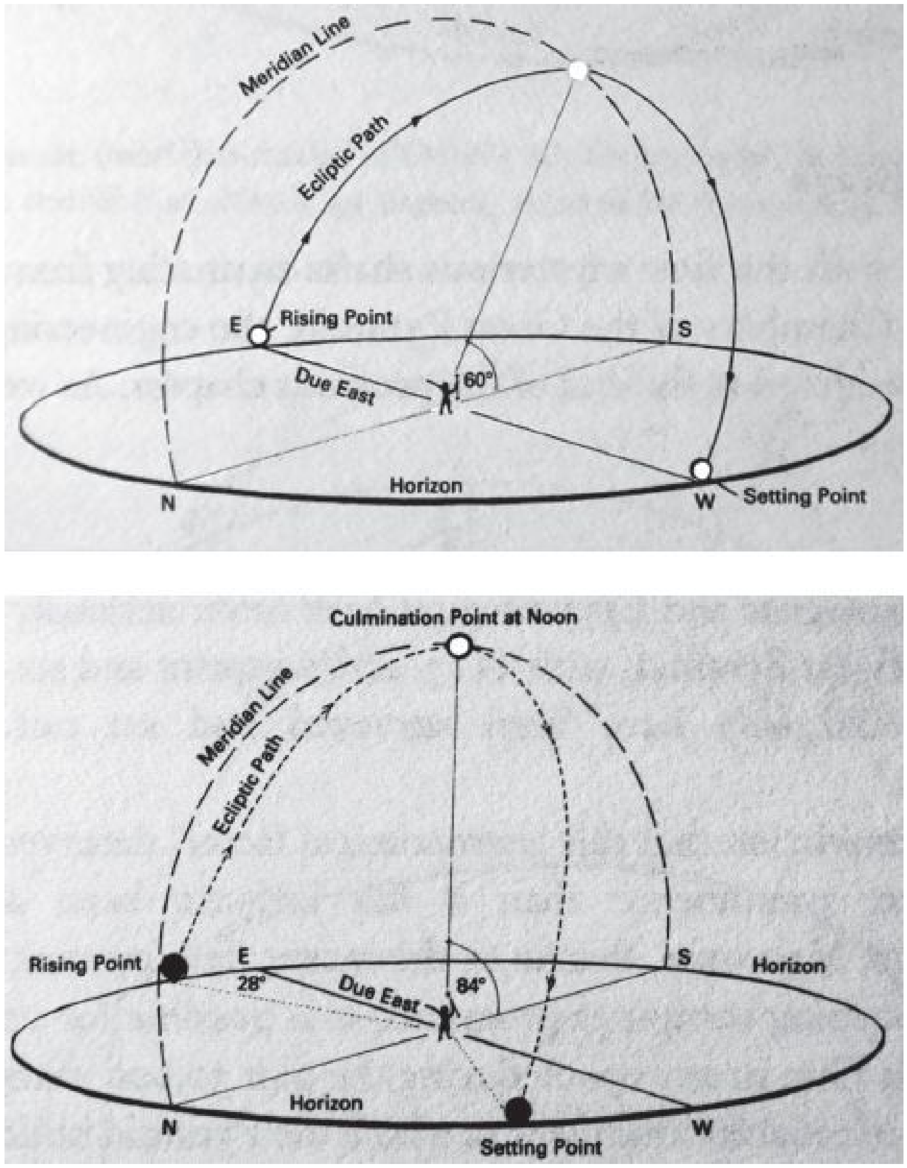


Fig. 5.22. The Quartet at equinox (top) and at summer Solstice (bottom). (Images courtesy of R. Bauval.)

Age of Taurus: 4320–2160 BCE

Age of Gemini: 6480–4320 BCE

Age of Cancer: 8640–6480 BCE

Age of Leo: 10,800–8640 BCE (emphasis added)

Age of Virgo: 12,960–10,800 BCE

Gurshtein's conclusion would, on face value, perfectly explain the astronomical design of the Giza necropolis except for the fact that the Great Sphinx is not a marker for the solstices, as he suggested, but for the equinoxes since it faces due east. We should, therefore, look for a time when one of these two zodiacal constellations defined an "age," that is, when such a constellation would rise due east at the spring equinox. This brings us, by necessity, to consider the age of Leo, which falls between 10,800 BCE and 8640 BCE. In the next chapter we shall see that the ideal date for the sky-ground correlation (Leo and Sphinx) works ideally for the epoch of circa 10,500 BCE.

But couldn't this alignment of the Great Sphinx with the rising of Leo, admittedly very intriguing, be just a coincidence? This could have been so, were it not for the fact that there is another set of monuments on the Giza necropolis that also tallies with the date of 10,500 BCE and, what is more, that both "work" together to produce a complete sky/ground correlation at that date! Let us see how this actually works . . .

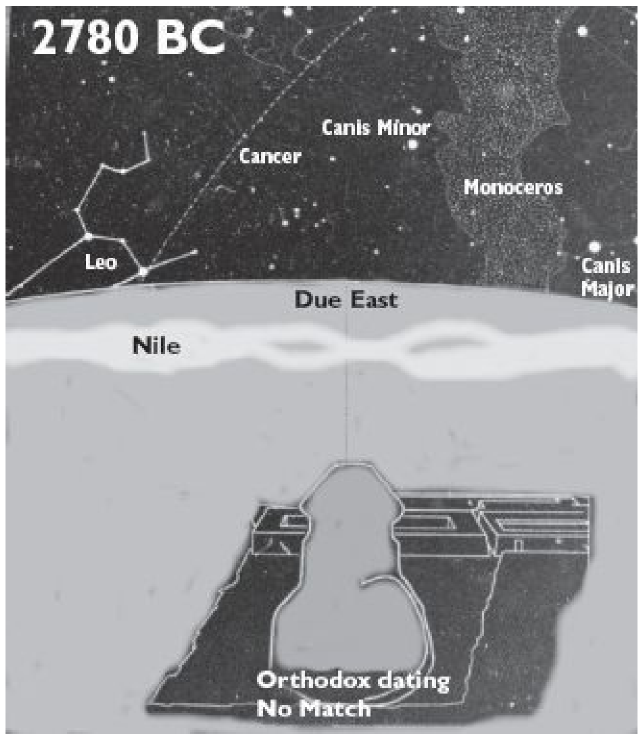


Fig. 5.23. Position of the zodiacal constellation of Leo in 2780 BCE. At this epoch Leo marked the summer solstice. (Image courtesy of R. Bauval.)

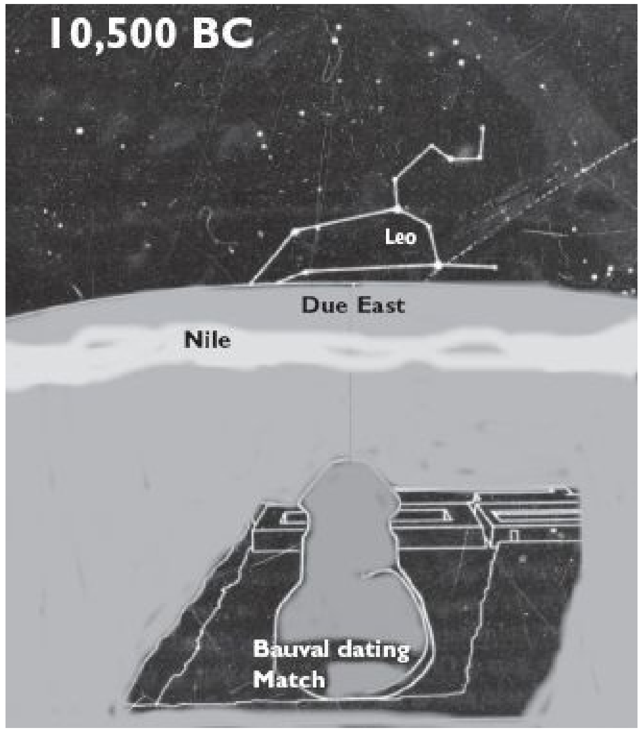


Fig. 5.24. Position of the zodiacal constellation of Leo in 10,500 BCE. At this epoch Leo marked the vernal/ spring equinox. (Image courtesy R. Bauval.)

Fig. 5.25. Position of the zodiacal constellation of Leo in 10,500 BCE. At this epoch Leo marked the vernal/spring equinox. (Image courtesy of R. Bauval.)

Chapter Six

THE PLACE WHERE THE GODS ARE BORN

Robert Bauval

I have come today, from out of the waters of the Inundation.

PYRAMID TEXTS 507

You are the lion . . . you are Horus, Protector of your Father . . . you make the Nile bring the Inundation.

COFFIN TEXTS 1–6

UNIFICATION OF THE TWO KINGDOMS

A peculiarity of the Nilotic people of ancient Egypt—other than seeing their land as “Upper” and “Lower” Egypt (i.e., Upper Egypt in the south, Lower Egypt in the north)—was their belief that Egypt was encompassed in two distinct kingdoms united under one ruler—a sort of pharaonic version of the United Kingdom of Britain. Open any modern textbook of Egyptology and you will be told—sometimes with unflinching certainty—that around 3200 BCE a powerful king from the south called Menes or Narmer brought about the “unification” of Egypt by conquering and annexing the northern part of the country. For example, the British Egyptologist I. E. S. Edwards informs us:

> Menes, at first king of Upper Egypt only, overcame the northern kingdom and united the two former kingdoms under one crown, established himself as ruler over the whole land. Memphis would thus have been the natural place for him to build a strong fortified city. . . . In unifying the two kingdoms, Menes performed a military feat that may have been attempted by others before his time, but never with more than temporary success. Menes, however, both achieved the military victory necessary for uniting the two kingdoms and ensuring that its effects would be lasting by following it up with an astute policy, on which the greatness of Egypt in the subsequent dynasties was founded. Nevertheless, the historical fact that Egypt had once consisted of two separate kingdoms was never entirely forgotten by its people, for down to the latest times the pharaohs still included among their titles that of “King of Upper and Lower Egypt.” (Edwards 1993, 3)

Not all Egyptologists, however, accepted the unification as being a historical event. Michael Hoffman, Ph.D., an accredited authority on predynastic Egypt, conceded that there is precious little evidence that supports this claim. According to Hoffman, the story of the unification “is culled from documents that come from hundreds if not thousands of years after the alleged event, by which time Menes, if he ever existed, had been transformed into a culture-hero whose life and accomplishments were embroidered with semi-mythical anecdotes” (Hoffman 1984, 289). And if this isn’t confusing enough, Czech Egyptologist Miroslav Verner Ph.D., further admits that “some researchers consider Menes a purely legendary figure” (Verner 2009, 16), while Jaromir Málek, Ph.D., the director of the Griffith Institute at the University of Oxford, goes even further by suggesting that the idea of two separate kingdoms “may be a projection of the pervasive *dualism* of Egyptian ideologies, not a record of a true historical situation” (italics added) (Málek and Baines 1991, 31).

In my opinion such academic mental gymnastics is used because Egyptologists simply fail to appreciate—or refused to consider, as the case may be—the fact that ancient Egyptians recorded their history in mythical-religious terminology that, as odd as it may seem to us today, was matched to observable events in the sky. To put it differently and in more poetic prose, the history of Egypt’s origins is *written in the sky*. Once this is realized and once we learn how to “read” the sky, the mist that has long shrouded Egypt’s origins from scholars begins to slowly dissipate.

First, however, we need to see Egypt the way the ancients themselves saw it. To do that we must, therefore, see Egypt *dualistically*. In this respect, Málek was quite correct in seeing the unification as a “projection of the pervasive *dualism* of Egyptian ideologies” (italics added). To put it a little differently, the ancient Egyptians saw not one but two “Egypts”: one for the living on the banks of the River Nile, the other for the dead on the banks of the celestial Nile. Egyptologist Mark Lehner got the closest in understanding this concept when he wrote, “The . . . Duat [the underworld or netherworld], often written with a star in a circle, [is] a reference to Orion, the stellar expression of Osiris, in the Underworld. Osiris was the Lord of the Duat, which like the celestial world—and the real Nile Valley—was both a water world and an earthly realm” (Lehner 1997, 29).

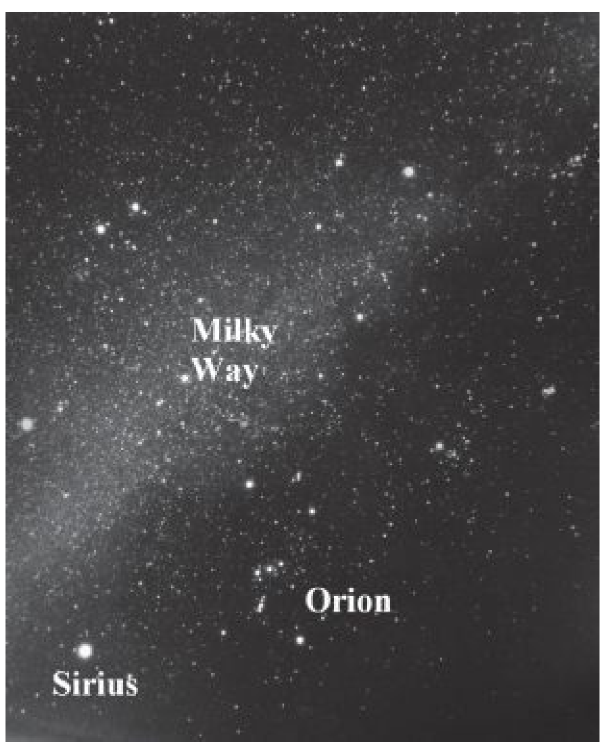


Fig. 6.1. The celestial duat. (Image courtesy of R. Bauval.)

THE UNIFICATION OF EARTHLY EGYPT AND COSMIC EGYPT

During the Napoleonic occupation of 1798 to 1801, a French soldier was wandering in the open countryside near Cairo when he noticed a group of villagers grinding wheat on a large black granite block. To his surprise, the block contained several rows of hieroglyphic inscriptions, which he immediately reported to his superior. The black stone was promptly confiscated from the villagers and taken to the French Army headquarters. After the full capitulation of the French Army to the British forces under General Ralph Abercrombie in September 1801, the black stone was acquired as war booty by the British and shipped to England, where today it is displayed in the ground floor gallery of the British Museum in London. The black stone—also known as the Shabaka Stone—is a thick granite slab measuring 92 centimeters by 137 centimeters and has sixty-four lines of hieroglyphic texts. Many of the inscriptions, however, are too damaged to be legible; enough remain, however, to give us rare insight into how ancient Egyptians saw the unification of Upper and Lower Egypt. The text is known as the Memphite Theology, and it was commissioned by King Shabaka (ca. 750 BCE). American philologist Miriam Lichtheim showed that the inscriptions resembled those of the Old Kingdom, and she consequently concluded that they were copied from a much older source. This is actually confirmed by the ancient scribe who carved the inscriptions: "This writing was copied out anew by his majesty [King Shabaka] in the house of his father Ptah-South-of-his-Wall [Memphis], for his majesty found it to be a work of the ancestors which was worm-eaten so that it could not be understood from beginning to end. His majesty copied it anew so that it became better than it had been before" (Lichtheim 1975, 51–52).

Henri Frankfort also agreed that the inscriptions on the black stone contained "traditions of the greatest antiquity" and added that "the text is a cosmology [that] . . . describes the order of creation and makes Egypt . . . an indissoluble part of the order" (Frankfort 1978, 24). Indeed, the text begins with the creation of the land of Egypt out of the primeval waters and tells how the "Mound of Creation" first appeared at Heliopolis. The story then moves on to narrate the epic quarrel of Horus and Seth over the inheritance of the kingdom of Osiris. The issue is finally resolved by Geb, the earth god, with the Council of the Nine Gods, also known as the Great Ennead. Here is an abbreviated version of the relevant passages:

> Geb, Lord of the Gods, commanded that the Nine Gods gather to him. He judged between Horus and Seth; he ended their quarrel. He made Seth king of Upper Egypt in the land of Upper Egypt, up to the place where he was born which is Su [a place near Herakleopolis]. And Geb made Horus king of Lower Egypt in the land of Lower Egypt, up to the place in which his father [Osiris] was drowned which is "Division of the Two Lands." Thus Horus stood over one region and Seth stood over one region. They made peace over the Two Lands at Ayan [a place near Memphis]. That was the division of the Two Lands. Geb's word to Seth: "Go to the place in which you were born." Seth: "Upper Egypt." Geb's words to Horus: "Go to the place in which your father was drowned." Horus: "Lower Egypt." Geb's words to Horus and Seth: "I have separated you." into Lower and Upper Egypt. Then it seemed wrong to Geb that the portion of Horus was like the portion of Seth. So Geb gave to Horus Seth's inheritance, for he is the son of his first born. Geb to the Nine gods: "I have appointed Horus, the firstborn." Geb's words to the Nine Gods: "Him alone, Horus, the inheritance." Geb's words to the Nine Gods: "To this heir, my inheritance." Geb's words to the Nine Gods: "To the son of my son, Horus." Then Horus stood over the land. He is the Uniter of this land. . . . Then sprouted the two great magicians [royal double-crown] upon his head. He is Horus, who arose as king of

> Upper and Lower Egypt, who united the Two Lands in the nome of the Wall [Memphis], the place in which the Two Lands were united. [Lotus?] Reed and Papyrus were placed on the double door of the House of Ptah [a creator god]. This means Horus and Seth, pacified and United. They fraternized so as to cease quarrelling in whatever place they might be, being united in the House of Ptah, the "Balance of the Two Lands" in which Upper and Lower Egypt had been weighed. This is the land . . . [of] the burial of Osiris in the "House of Sokar." . . . (Lichtheim 1975, 52–53)

The protagonists of the unification are members of the original divine family/pantheon of Heliopolis, and the event takes place in the primeval golden-age setting of *zep tepi* (the first time). Horus and Seth are presumably royal princes who quarrelled over the inheritance of Osiris, the dead king. Horus is the son of Osiris, while Seth is the brother of Osiris. Both, it would seem, have legitimate claim to the kingdom. At any rate, the earth god, Geb, who is the grandfather of Horus and clan elder, acts as arbitrator. At first he allocates the south of Egypt to Seth and the north to Horus, but then has second thoughts, changes his mind, and, with the approval of the Council of the Nine Gods, allocates the *whole of Egypt* (i.e., the two kingdoms) to Horus because Geb says that Horus is "the son of his firstborn son" (i.e., Osiris). But here we butt against a paradoxical conundrum that has plagued Egyptologists for many decades: the unpalatable and hard-to-swallow fact that there is absolutely no mention, not even one single reference, to Osiris *before* the Fifth Dynasty, that is, *one hundred years after* the construction of the Giza necropolis. Yet it is also a fact that Osiris's sister-wife, Isis, *does* appear in texts of the Fourth Dynasty, as does Horus, son of Osiris. But how can this be when the inscriptions on the Shabaka Stone state categorically that Osiris was the original ruler-king of Egypt in the golden age of zep tepi?

Is it possible that "Osiris," whoever he really was, took over the position of the Re-Horakhti, the sun god, as "father" of Horus from the Fifth Dynasty onward? Could it be that Osiris, like Jesus, who suddenly appears in the Bible story to reform Judaism, reformed the original sun religion by introducing a "stellar" component? In other words, could the Pyramid Texts be the "New Testament" of an older solar religion, which like the new Jesus religion (Christianity) could not be fully severed from the older Judaic religion, in the same way the new Osirian stellar religion could not be fully severed from the older solar religion? This is strongly hinted at, if not proved, in the Pyramid Texts, where we find many passages in which the dead king joins Osiris in what can be termed a stellar rebirth but then, and seemingly in total contradiction, at the same time also joins the sun god in a solar rebirth. The contradiction, however, disappears, as we shall see, when it is understood that both "rebirths" take place at the same time and at the same location in the sky: *at dawn in the eastern horizon during the time of the Inundation*. These passages, for example, in the Pyramid Texts present these stellar and solar rebirths in a sort of mythological-astronomical language based *on actual observation of the eastern horizon at dawn*.

> [The king joins Osiris and becomes a star in Orion in the eastern horizon at dawn]: Behold he [the dead king] has come as Orion; behold Osiris has come as Orion . . . O [dead] King, the sky conceives you with Orion; the dawn-light bears you with Orion . . . you [the king] will regularly ascend with Orion from the Eastern sky of the sky . . . [Pyramid Texts 819–821]. . . . You [the king] are this Great Star, the companion of Orion, who traverses the sky with Orion, who navigates the Duat with Osiris; you ascend from the East of the sky . . . the sky has borne you with Orion. [Pyramid Texts 882]

[The king joins Re (the sun god) and Horakhti (celestial sphinx?) in the eastern horizon at dawn]: The reed-floats of the sky are set in place for Re [the sun god] that he may cross [the celestial Nile/ Milky Way] on them to the horizon. The reed-floats of the sky are set in place for Horakhti [the dead king?] that he may cross [the celestial river] on them to Re. The reed-floats of the sky are set in place for me [the king] that I may cross [the celestial river] on them to the horizon to Re. The reed-floats of the sky are set in place for me that I may cross [the celestial river] on them to Horakhti and Re . . . the Fields of Rushes are filled [with water], and I ferry across the Winding Waterway [celestial river/Milky Way]; I am ferried over to the Eastern side of the horizon; I am ferried over to the Eastern side of the sky [Pyramid Texts 337]. The reed-floats of the sky are set down Horus [the king] that he may cross on them to the horizon, to Horakhti. The reed-floats are set down for me that I [the king] may cross on them to the horizon, to Horakhti . . . the Winding Waterway [celestial river/Milky Way] is flooded, the Fields of Rushes are filled with water, and I am ferried over thereon to yonder eastern side of the sky [Pyramid Texts 342–45]. The doors of the sky are opened, the doors of the firmament are thrown open at dawn for Horakhti . . . the doors of the sky are opened, the doors of the firmament are thrown open at dawn for myself. [Pyramid Texts 525–30]

What appears at first to be a contradiction may not be a contradiction at all but perhaps an astronomical observation that needs to be understood. But if so, what was being observed in the eastern horizon at dawn at the time of the Inundation?

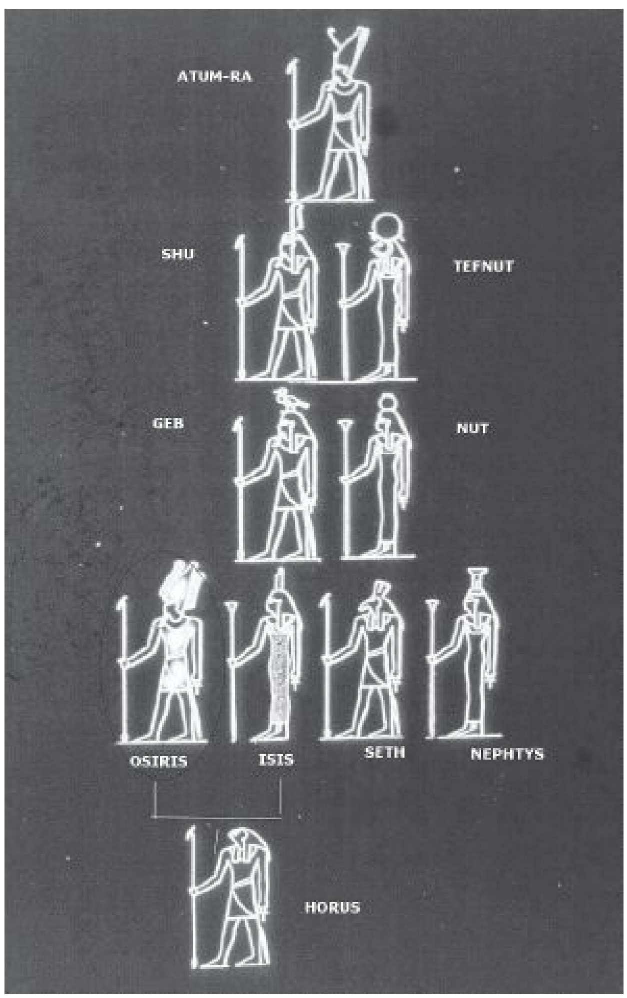


Fig. 6.2. The Great Ennead of Heliopolis. The nine gods plus Horus. (Image courtesy of R. Bauval.)

Before we tackle these questions, we must first clear a confusing and probably erroneous interpretation by Egyptologists that the Pyramid Texts embody an older stellar cult that was "absorbed" into a solar cult instigated by the priests of Heliopolis in the Fourth Dynasty. For example, in 1912 the American Egyptologist James H. Breasted wrote:

> The "east" . . . is the east of the sky, and the realm of the dead is a celestial one . . . two ancient doctrines of this celestial hereafter have been commingled in the Pyramid Texts: one represents the dead as a star, and the other depicts him as associated with the Sun-god, or even becoming the Sun-god himself. . . . While there are Utterances in the Pyramid Texts which define the stellar notion of the hereafter without any references to the solar faith, *and which have doubtless descended from a more ancient day when the stellar belief was independent of the Solar*, it is evident that the stellar notion has been absorbed by the solar. . . . The Solar beliefs predominate so strongly that the Pyramid Texts as a whole and in the form in which they have reached us may be said to be of Solar origin." (Breasted 1912, 101–2; italics added)

Breasted's hypothesis that the older "stellar" cult was "absorbed by the solar" cult of Heliopolis received the seal of approval from Edwards in 1947 (Edwards 1947, 32; Edwards 1993, 284) and since then it has been regularly parroted by Egyptologists. Although it is true that the Pyramid Texts do contain a stellar cult and a solar cult, I have become convinced that the "solar" *preceded* the "stellar" and that the latter was merged with the former in the Fifth Dynasty. I believe that there were *two phases of construction* on the Giza Plateau: an older "solar" phase involving the Great Sphinx and its temples, followed later by a "stellar phase" involving the three major pyramids and, furthermore, that both were merged to create an *overall scheme* to represent zep tepi in the Fourth Dynasty.

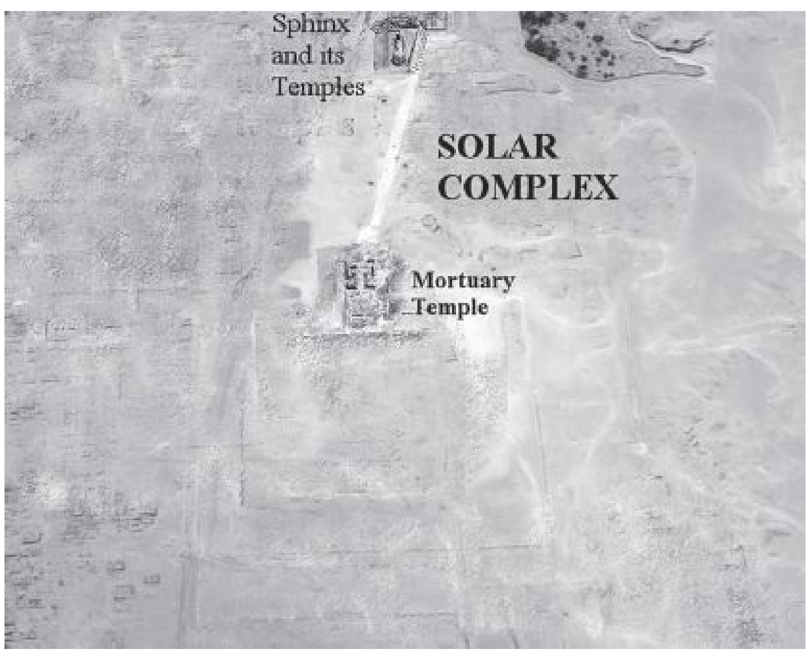


Fig. 6.3. The older-phase "solar complex" (ca. 10,500 BCE?). (Image courtesy R. Bauval.)

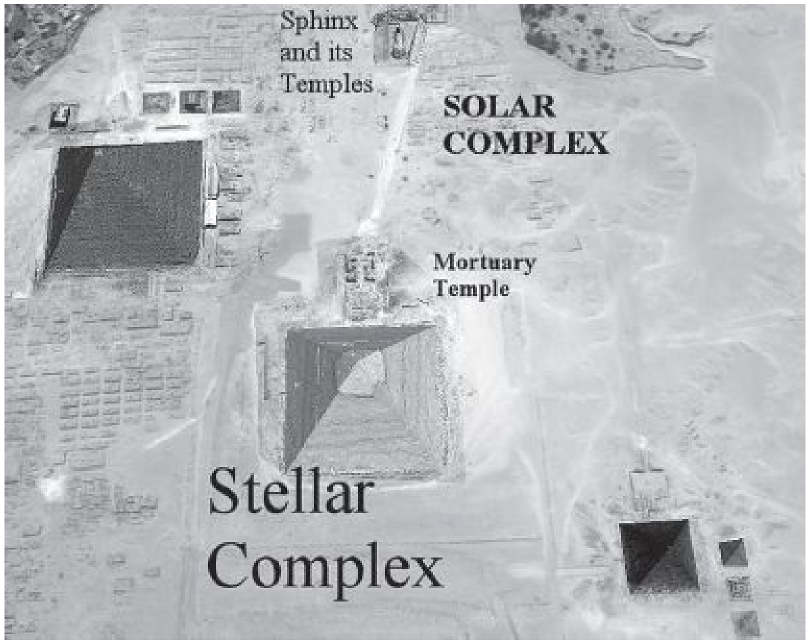


Fig. 6.4. The combined "solar" and "stellar" phases to represent zep tepi (ca. 2500 BCE). (Image courtesy of R. Bauval.)

Fig. 6.5. The "zep tepi complex," the place where the "gods were born." (Photo courtesy of R. Bauval.)

THE IMAGE OF HEAVEN

We now turn again to the Pyramid Texts to see how and why the notion of Osiris and stellar rebirth was introduced and merged with that of the older solar rebirth of Re-Horakhti.

We have already seen how the time and location of rebirth was at dawn in the eastern horizon at the start of the Inundation season.[*40] We have also seen how this event corresponded to the summer solstice in late June during the pyramid age. On that special day Orion would be seen rising in the eastern sky, which was regarded as a celestial euphemism of the rebirth of the Osiris-king. But the Pyramid Texts also present us with another image in the eastern sky at that time of year, namely the crossing of the celestial Nile/Milky Way of the deceased to join the sun god Re and Horakhti in the eastern horizon. So let us reconstruct the sky for the pyramid age and see what the ancients saw at dawn on that special day of "rebirth."

We will take 2300 BCE as the date when the Pyramid Texts were compiled (although they were almost certainly composed much earlier). This will allow us to "see," in a virtual sky, what the ancient priests of Heliopolis observed in the eastern horizon and, hopefully, comprehended what induced them to compose texts such as those we have quoted above, that is, texts that combine a stellar and solar rebirth for the departed kings at a given moment of the year. Using Starry Night Pro astronomy software we set the location for Heliopolis at 30º07´48˝ N and 31º18´28˝ E, and the epoch at 2300 BCE. We then placed the sun (Re) on the west "bank" of the Milky Way as instructed by the Pyramid Texts: "The reed-floats are set in place for Re so that he may cross [the celestial Nile/Milky Way]."

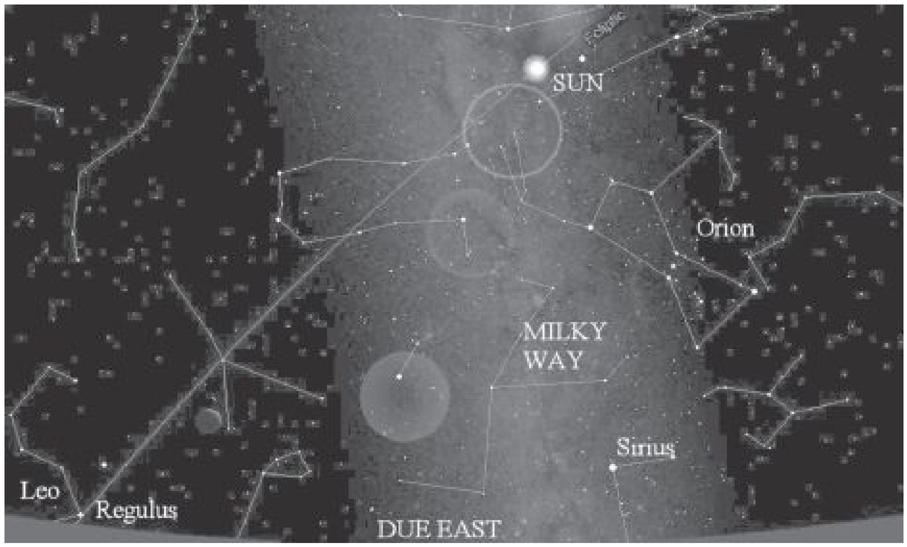


Fig. 6.6. The year 2300 BCE. The sun is on the "west" bank of the Milky Way (in the "reversed" Egyptian directional format).[*41]

We then activated the time so that the sun would be made to "sail across" the Milky Way toward the eastern horizon, as also instructed in the Pyramid Texts: "The reed-floats are set in place for Re so that he may cross [the celestial Nile/Milky Way] on yonder side of the sky to the eastern horizon." In order to reach this destination the sun has to "travel" or "sail" across the Milky Way so that some seventy days later it will reach the star Regulus, located on the "breast" of the constellation of Leo, which was the spot in the sky that marked the position of the sun at summer solstice in 2300 BCE. This is without question an intensely "solar" event that was observed in the eastern horizon that can be metaphorically matched with the relevant passages in the Pyramid Texts. But what, then, of the "stellar" events that were also observed in the eastern horizon at that same time of year during these seventy days? Once the sun has "sailed" across the Milky Way, an observer will also see the constellation of Orion rising for the first time just before dawn. This observation is clearly described in the Pyramid Texts: "Behold he [the dead king] has come as Orion; behold Osiris has come as Orion. . . . O [dead] King, the sky conceives you with Orion; the dawn-light bears you with Orion . . . you [the king] will regularly ascend with Orion from the Eastern sky of the sky."

Finally when the sun reaches the "breast" of the Lion (i.e., Leo), the apotheosis takes place with the first appearance of the star Sirius. This, again, is expressed in the following passage of the Pyramid Texts where Horus, son of Osiris (also the dead king) is addressed in this manner: "You [the king] are this Great Star, the companion of Orion, who traverses the sky with Orion, who navigates the Duat with Osiris; you ascend from the East of the sky . . . the sky has borne you with Orion."

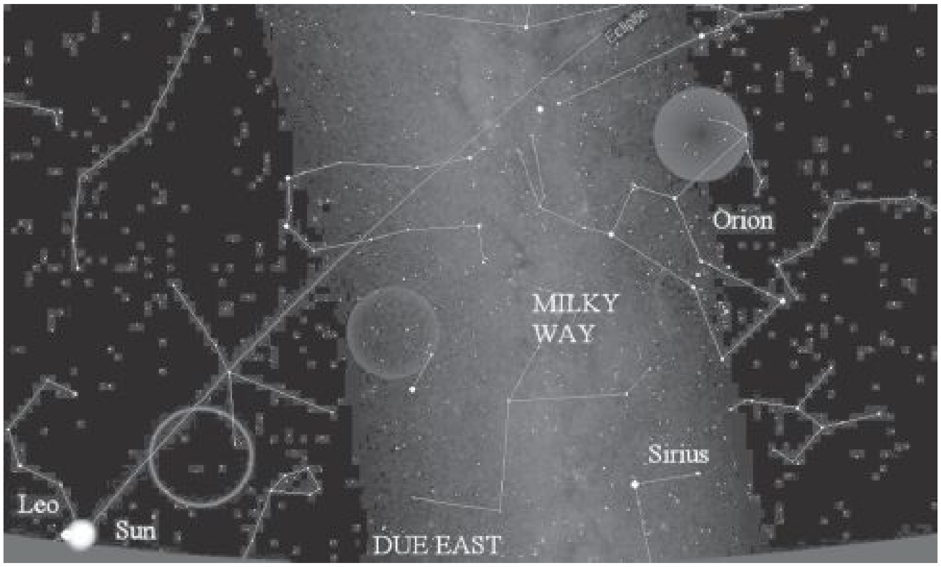


Fig. 6.7. The year 2300 BCE. The sun has crossed the Milky Way and traveled seventy days to reach the "breast" of Leo. At this moment the star Sirius rose heliacally.

Fig. 6.8. The gaze of the Great Sphinx is due east. (Image courtesy of R. Bauval.)

The closure of the dualistic cosmic event comes when the light of the rising sun causes the stars to fade and be "absorbed" by the dawn, as poetically described in the following passage in the Pyramid Texts: "Orion is encircled [faded] by the dawn, while the Living One [Horus] washes himself in the Horizon; Canis Major is encircled [faded] by the dawn, while the Living One washes himself in the Horizon; this [departed] King is encircled [faded] by the dawn, while the Living One washes himself in the Horizon" (Pyramid Texts 151).[*42]

If our identification of Leo with the "celestial sphinx" is correct, then something is—on first appearance—not quite right. This is the problem: the position of the sun in Leo in the eastern horizon is at (near) summer solstice some 28º north of east (azimuth 62º) at the epoch of 2300 BCE . . . whereas the Great Sphinx's gaze is directed *due east* (azimuth 90º), at equinox!

In order to have the sun in Leo be in alignment with the Great Sphinx, we have to go back in time to 10,500 BCE, and when this is done at the vernal/spring equinox, the sun in Leo is now due east, and, what is more, the constellation of Orion is seen *due south* such that the pattern and angle made by the three stars of Orion’s Belt uncannily match that of the three pyramids of Giza and, furthermore, the Milky Way (the celestial Nile) now appears to flow down into the River Nile. The probability of these correlations happening at the same epoch (10,500 BCE) and time (spring equinox) make it a very unlikely coincidence!

Fig. 6.9. The gaze of the Great Sphinx is due east.
(Photo courtesy of R. Bauval.)

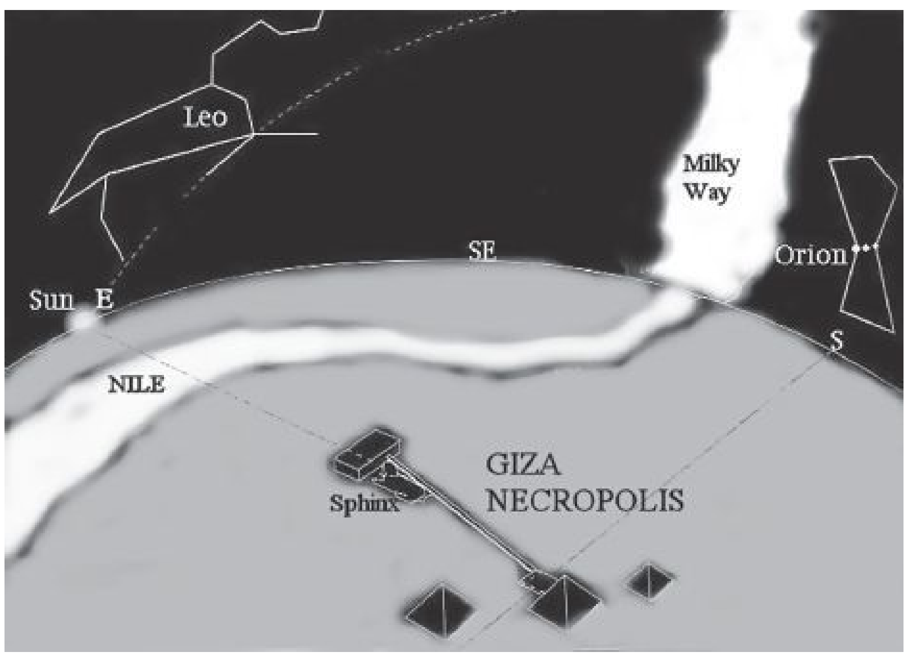


Fig. 6.10. The sky in 10,500 BCE at the vernal/spring equinox and the “Quartet of Leo.” (Image courtesy of R. Bauval.)

THE ORION CORRELATION THEORY

For those unfamiliar with the Orion correlation theory (OCT), the three illustrations in figure 6.11 explain it at a glance. This theory, which I developed in 1983, is based on the following set of evidence:

1. Orion was identified with Osiris. Dead kings were imagined to join Osiris in the celestial duat or even to become an “Osiris.”
2. The Pyramid Texts indicate Orion as the principal afterlife abode/destiny for the departed kings.
3. The southern shaft of the King’s Chamber in the Great Pyramid pointed to Orion’s Belt circa 2500 BCE.
4. The three pyramids of Giza are on the west bank of the Nile and set diagonally relative to the Nile; the three stars of Orion’s Belt are on the “west” bank of the Milky Way and set diagonally to the Milky Way.
5. The line passing through the two larger pyramids of Giza does not pass through the third smaller pyramid, the latter being slightly offset to the left (east). The line passing through the two “larger” (brighter) stars of Orion’s belt does not pass through the third “smaller” (dimmer) star, the latter being slightly offset to the left (east).[*43]

All of this clearly raises the question, Could 10,500 BCE be the zep tepi epoch, and, more intriguingly, could the *splendid place of zep tepi* be where the Great Sphinx is located? Is there something in this astronomical scheme that might be interpreted as a “first time” or a “beginning”?

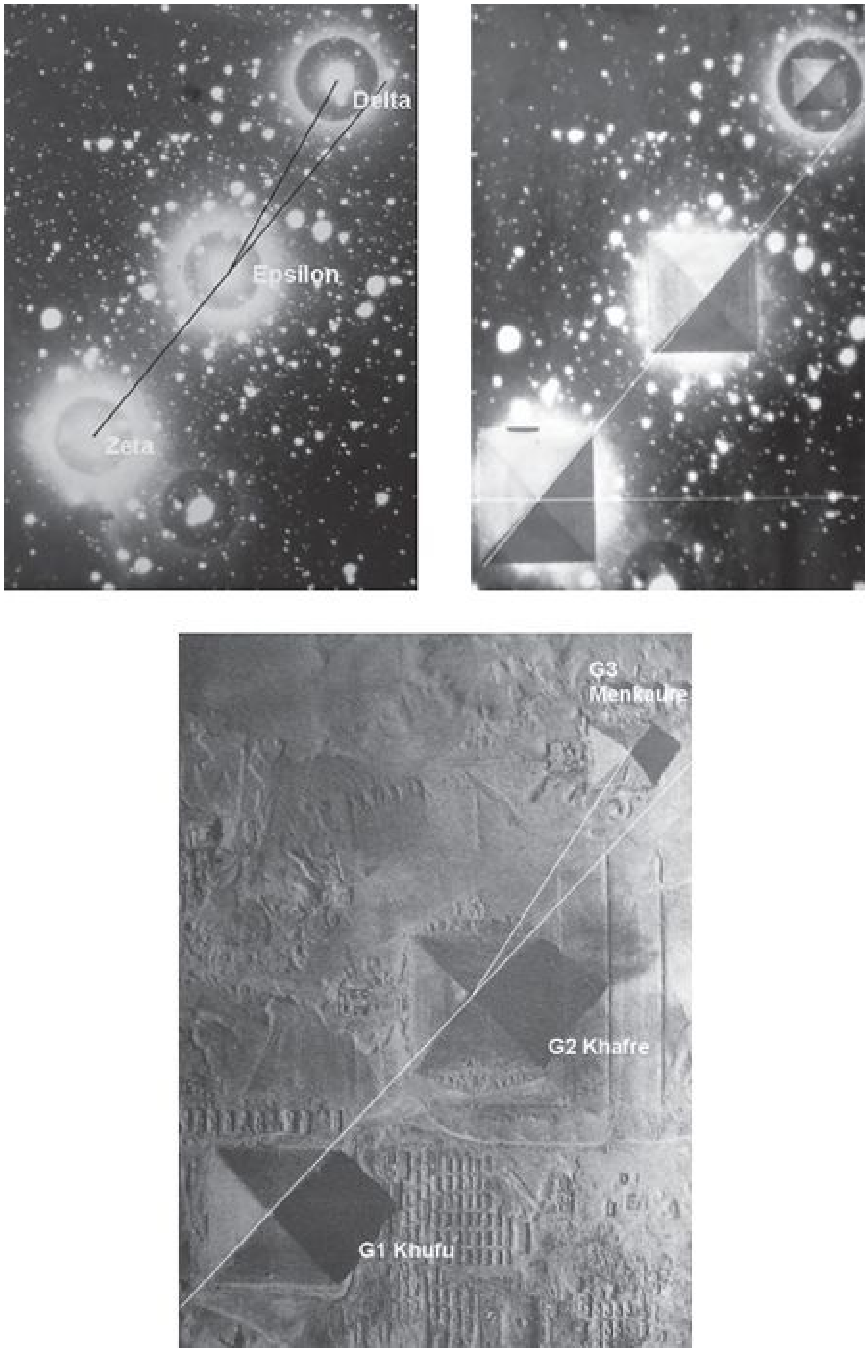


Fig. 6.11. The Orion correlation theory at a glance. (Images courtesy of R. Bauval.)

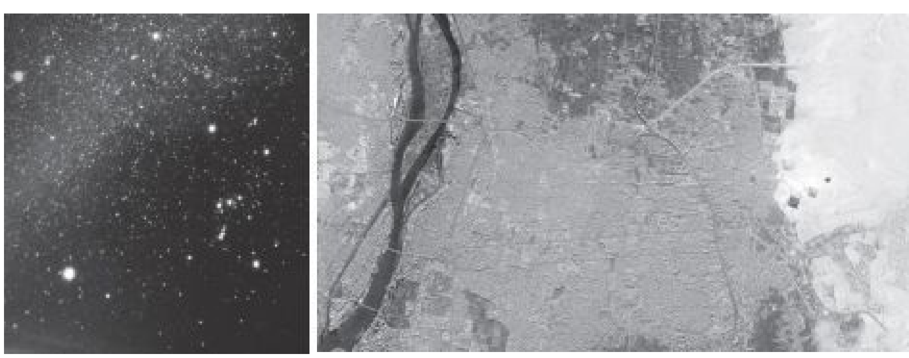


Fig. 6.12. Orion and the Milky Way (left), Giza and Nile (right). (Images courtesy of R. Bauval.)

THE "FIRST TIME" OF OSIRIS-ORION

Seen today from the latitude of Giza (about 30º N), Orion's Belt will rise almost due east and will reach an altitude of about 60º at culmination. This position, however, will change in time due to the Earth's motion of precession. When the Great Pyramid was constructed in 2500 BCE, Orion's Belt rose in the southeast and would reach an altitude of about 45º at culmination; this was also when the southern shaft of the King's Chamber of the Great Pyramid was directed to the belt. However, in 10,500 BCE Orion's Belt would have risen almost due south and would have been at about 10º at culmination. The latter can be regarded as the lowest point of Orion's Belt in the precession cycle, that is, its nadir or, one could say, the "beginning" or "first time" of the cycle of Orion's belt. And since Orion was identified with Osiris, then it can be metaphorically said to be *the "first time" of Osiris* . . .

Orion's Belt, however, does not just move up and down at the meridian during the precession cycle but also *rotates* such that in 10,500 BCE it would have had almost the same angle with the meridian as did the three pyramids with the ground. Similarly, the Milky Way would have rotated in such a way as to appear to "flow" down into the Nile on the ground, giving the impression that they met in the distant south.

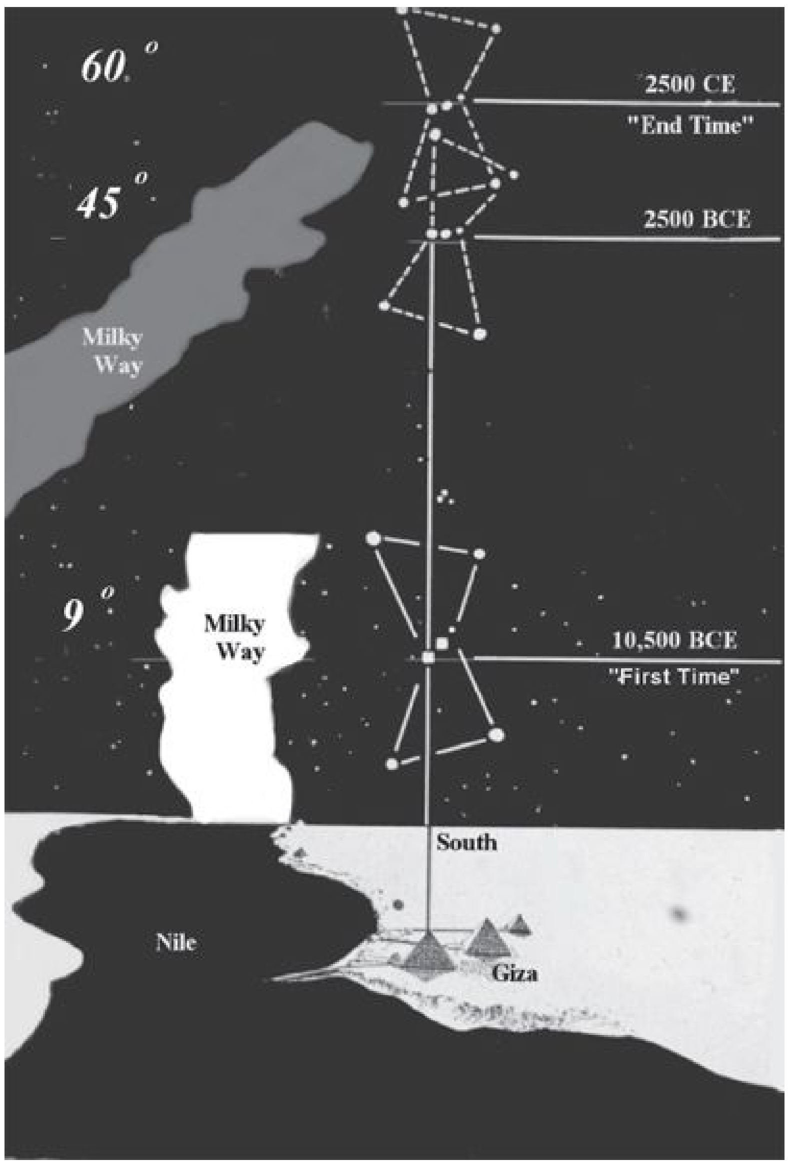


Fig. 6.13. As the position of Orion is seen to go down from 2500 CE to 10,500 BCE, the sky also appears to rotate counterclockwise, bringing Orion's Belt and the Milky Way in full correlation with the pyramids and the Nile. (Image courtesy of R. Bauval.)

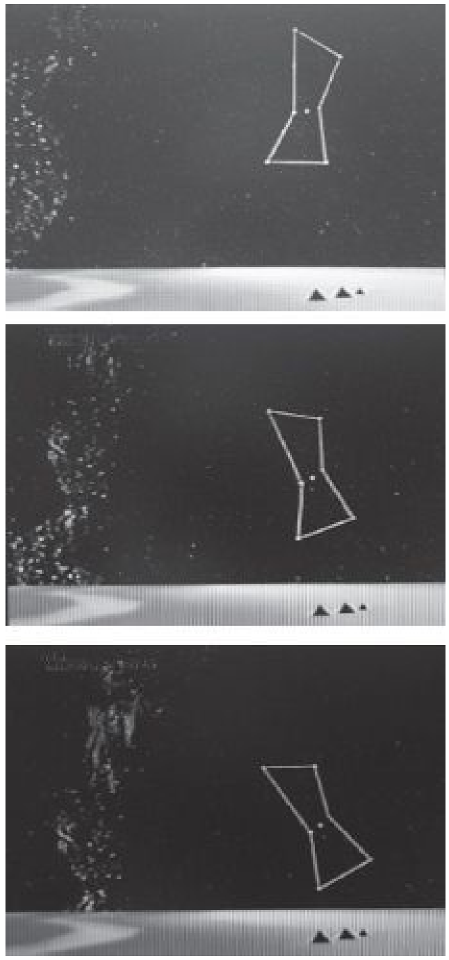


Fig. 6.14. As the position of Orion is seen to go down from 2500 BCE to 10,500 BCE (top to bottom), the sky appears to rotate counterclockwise, bringing Orion's Belt and the Milky Way to "lock" into the ground image of the pyramids and the Nile. (Images courtesy of R. Bauval.)

Fig. 6.15. Orion in 2500 BCE at the meridian (left) and Orion in 10,500 BCE at the meridian (right).

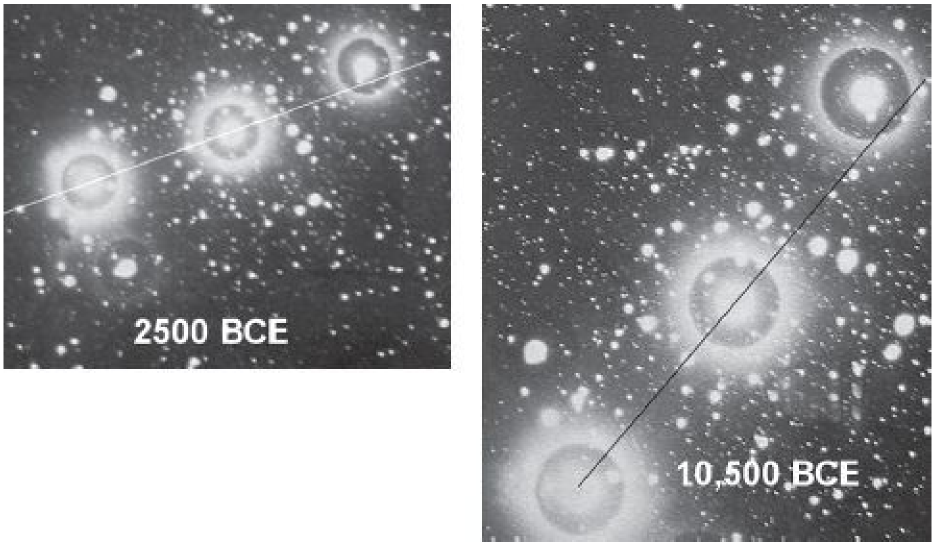


Fig. 6.16. Orion's Belt in 2500 BCE at the meridian (left) and Orion's Belt in 10,500 BCE at the meridian (right). (Images courtesy of R. Bauval.)

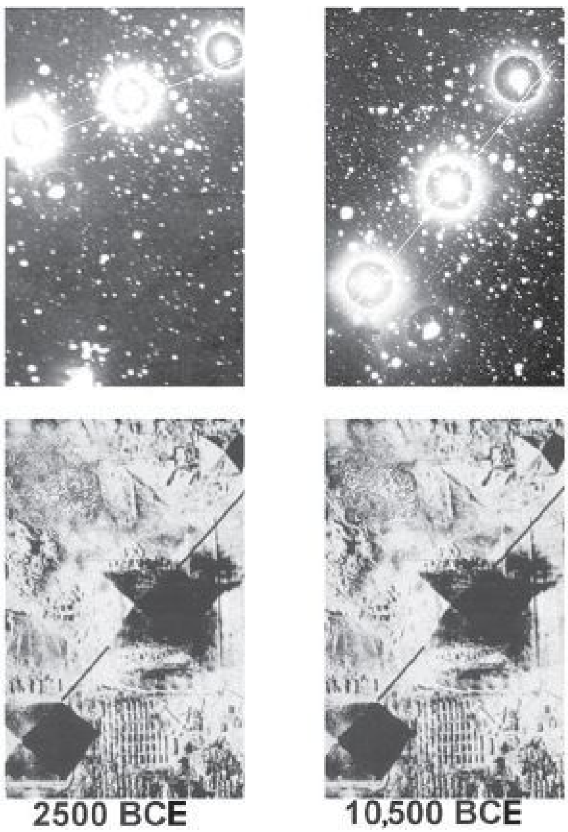


Fig. 6.17. The OCT illustrated for 2500 BCE and 10,500 BCE. (Image courtesy of R. Bauval.)

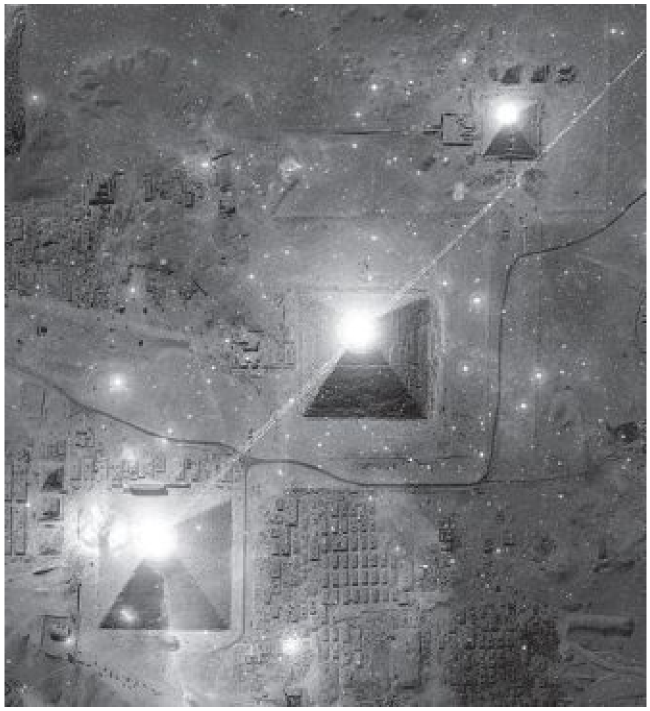


Fig. 6.18. The three stars of Orion's Belt superimposed on the three pyramids of Giza. The dimmer (smaller) star, Mintaka/Delta Orionis, is at the top of the smallest pyramid, the Pyramid of Menkaure. (Image courtesy of R. Bauval.)

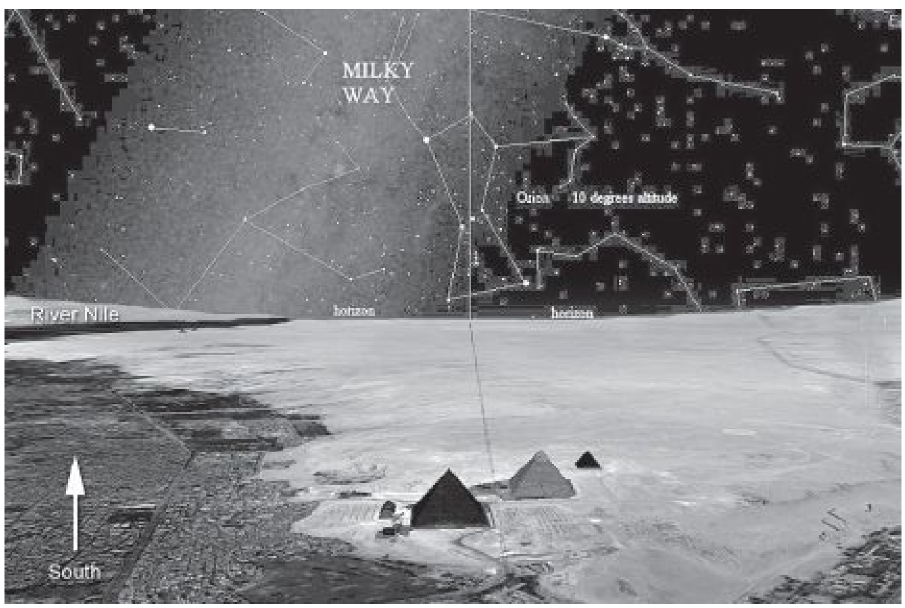


Fig. 6.19. An artist's impression of the view looking south over the Giza necropolis in 10,500 BCE, when Orion's Belt was at the meridian.

For coincidence to be at play in these interlocking sky-ground correlations has been shown to be statistically improbable. Recently, the core of the OCT (i.e., the correlation of the Giza pyramids with Orion's Belt) has been passed through rigorous qualitative and statistical analyses by the Department of Mathematics and Physics of the University of Salento in Italy, and the results showed that it could not be falsified (see appendix 2). Nonetheless, the connection of the Great Sphinx with the epoch of 10,500 BCE or any other older date cannot be *proved* only by astronomy. So this is as far as the OCT can take the investigation.

It has been said that architecture is "frozen music." We can also add that the architecture of the Great Sphinx is also "frozen time." In this respect, what is needed to confirm a physical connection of this monument with zep tepi is another branch of science that can quite literally *date when the stones of the solar complex were carved and assembled into the structures we see today.*

And this branch of science is geology . . .

Chapter Seven

THE WRITING ON THE WALL

Robert M. Schoch

Schoch presents a fairly convincing case for evidence of water erosion on the Sphinx and the limestone walls of its enclosure. His findings are disturbing since there is no logical source for water to erode the Sphinx and its enclosure walls in the conventional time frame suggested by Egyptologists. Rainfall was abundant in the region only thousands of years before the rule of Chephren. . . . The Egyptological establishment still needs a better response to the questions raised by Schoch regarding the source of erosion on the Sphinx—wind or water.

PETER S. ALLEN (RHODE ISLAND COLLEGE), 1994, FROM A FILM REVIEW OF THE MYSTERY OF THE SPHINX

As we have seen, the dating of the Great Sphinx to the Fourth Dynasty, to the period of Khafre/Chephren or Khufu/Cheops, is entirely circumstantial. I do not know how many times I have been told by professional Egyptologists that their field relies heavily on "context," and according to them the context of the Great Sphinx is that it lies within the Old Kingdom Giza necropolis, and therefore, they assure me, the Sphinx too must be attributable to the Old Kingdom (and more specifically to the Fourth Dynasty). End of story. However, I find this line of thinking rather weak, to put it mildly. In modern Istanbul one can still visit the magnificent Hagia Sophia, first built as a Christian church in the sixth century CE, later converted to a mosque, and now serving as a museum. The Hagia Sophia has been repaired and restored and had portions rebuilt over the centuries, but the core structure from late antiquity remains. Imagine some horrible catastrophe (whether human created or natural) fifty years into the future that destroys and buries Istanbul, leaving it for archaeologists to excavate in the year 7067 CE. I suppose that if archaeologists five thousand years from now were to apply current "modern" logic regarding "context" to the Hagia Sophia, they might attribute this magnificent building to the twenty-first century since it is located within the context of twenty-first-century structures. Of course, they would be wrong.

The idea that the Great Sphinx might go back to an earlier period, an epoch prior to that of the dynastic Egyptians (that is, prior to ca. 3100 BCE), is not just idle speculation. As we already discussed (see chapter 2), the seismic investigations that geophysicist Thomas Dobecki and I carried out around the Great Sphinx provide a strong argument that the core body—the oldest portion—of the Great Sphinx dates back to a period thousands of years prior to the standard attribution of circa 2500 BCE. I contend that when properly understood, the seismic data alone are sufficient to corroborate the hypothesis of an older

Great Sphinx. However, the seismic data and analyses, although in my mind they are fairly straightforward, have been misunderstood (in at least some cases, I believe purposefully misunderstood), misconstrued, and misrepresented by many of my critics and opponents. But there is much more evidence, independent of the seismic studies, supporting the contention that the Great Sphinx has its origins well prior to circa 2500 BCE.

There is strong, and in my assessment compelling, evidence that the Old Kingdom Egyptians did not create the statue de novo, but reused, restored, and reworked a preexisting, and much older, monument—evidence that, once recognized, to many people appears simple and obvious. Take, for instance, the disproportionately small size of the Great Sphinx's head relative to the body. Upon my first inspection of the Great Sphinx, I noticed this anomaly and came to the working hypothesis that the current head (which struck me as rather androgynous; it could be male or female, although I tend to think of it as a female) is not the original head, but a recarving of a former and larger head. It is a dynastic-style head, in keeping with the idea of the reuse of an older monument by the dynastic Egyptians: the head does not demonstrate that it was the dynastic-period Egyptians who first carved the original structure that was later to become the monument we now know as the Great Sphinx. As early as 1990 I speculated that originally the "Great Sphinx" was not a sphinx at all, but rather was a statue of a giant recumbent lion in its first incarnation (whether it was a male or female lion remains an open question).

I first visited Egypt during the summer of 1990 at the request of John Anthony West, the rather outspoken maverick scholar and self-styled "rogue Egyptologist." My mission was explicitly to take a look at the Great Sphinx with a geologist's eye. West, who is perhaps the foremost proponent of the Egyptological studies of the late philosopher and mathematician René Adolphe Schwaller de Lubicz (1887–1961; he also went by the occult name AOR), was (and still is, although I write this with the greatest respect as we have become close friends) persona non grata among most professional Egyptologists. Despite my credentials as a geologist, I found that I was not always taken seriously, at least initially, due to the "West connection." As Dennis C. Forbes, editor of *KMT, A Modern Journal of Ancient Egypt*, wrote in 1992, "Professor Schoch's field research on the Giza Plateau had been initiated by John Anthony West . . . whose personal agenda regarding the study of ancient Egypt is somewhat outside the 'mainstream' of academic Egyptology. West's perceived association with Schoch, therefore, immediately prejudiced the latter's findings and made the whole purpose of his Sphinx investigations highly suspect in the view of academic Egyptologists generally" (Forbes 1992, 53).

SOME PERSONAL BACKGROUND

It was in the early 1990s that I first proposed that the Great Sphinx of Giza dates back thousands of years prior to the standard attribution of circa 2500 BCE. To get right to the point (and this is discussed in more detail later in this chapter and in appendices 6, 7, and 8; see also the discussion of the seismic data in chapter 2), analyzing all of the evidence we currently have at hand, I now find it tenable that the oldest portions of the core body of the Great Sphinx, the original carved portions of the leonine form, may well go back to the end of the last ice age. (Based on the current geological data, the last ice age ended ca. 9700 BCE; Walker et al. 2008.) But how did I arrive at the point of even becoming involved in studies of the Great Sphinx?

As a young child, I had always taken an interest in ancient history. My late (and much beloved) grandmother, Adriana M. Goetz, owned various books on ancient subjects, which I loved to pore through, including an early-twentieth-century guide to the Egyptian collections at the British Museum. And I remember going with my parents to an exhibition of treasures of Tutankhamun when it came to the National Gallery of Art in Washington, D.C. (I was born and raised in the District of Columbia area.) I believe this was in 1961, and so I was very young indeed! Thus I was certainly interested in Egypt and knew something of the Great Sphinx, but in my early years I was more attracted to later classical Greco-Roman antiquity, particularly late antiquity, such as middle and late Imperial Roman times. I was also familiar with classical literature, as I was sometimes known to sneak away from classes while in high school (in America, the years before undergraduate university studies), going to the public library down the street to quietly read *The Meditations of Marcus Aurelius* or the works of Plato.

I attended George Washington University in Washington, D.C., earning undergraduate degrees in geology (1979) and anthropology (1979), before heading to Yale University in New Haven, Connecticut, to earn a couple of master's degrees (M.S. 1981; M.Phil. 1981) and a Ph.D. in geology and geophysics (1983). In 1984 I began my teaching career at Boston University, where I have worked full time ever since. I never forgot about my interest in ancient cultures, but in those early professional years my time was spent on other topics such as the evolution of early mammals and various geological studies. This all changed in the late 1980s when I was introduced, initially in a very roundabout way, to the work and then the person of John Anthony West.

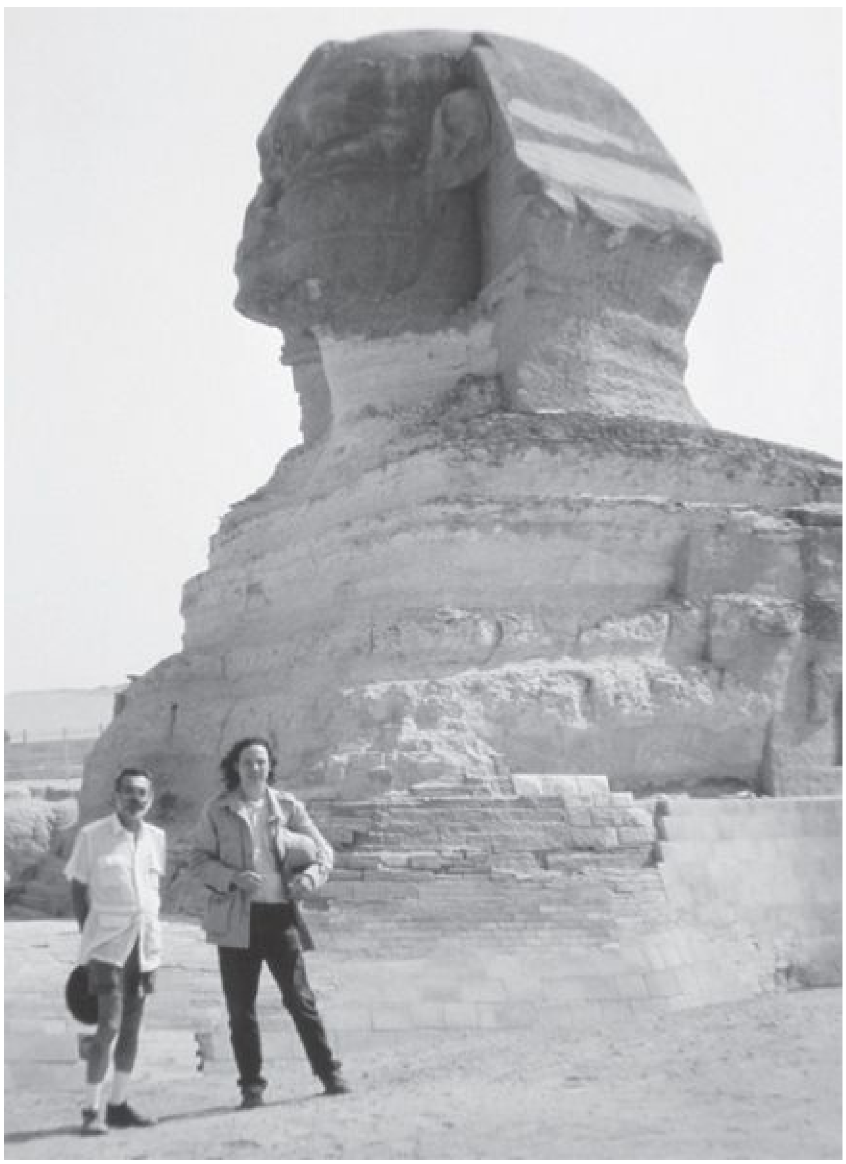


Fig. 7.1. Early 1990s photograph of John Anthony West (left) and Robert Schoch (right) standing in front of the Great Sphinx.
(Photo courtesy of R. Schoch.)

Fig. 7.2. Robert Schoch (left) and John Anthony West (right) revisiting the Great Sphinx, July 2016. (Photo courtesy of C. Ulissey.)

My divisional chairman at the time was the late Professor Charles P. "Phil" Fogg. I still remember well the day he showed me a copy of a curious 1985 guidebook that West had written, titled *The Traveler's Key to Ancient Egypt*. In it was a rather unorthodox discussion of the Great Sphinx, which I read with great interest. In particular, the following lines caught my attention.

> Schwaller de Lubicz observed that, in his opinion, the dramatically severe erosion on the body of the Great Sphinx could not be the result of wind and sand, as is universally assumed, but was rather the result of water. Geologists agree that in the not so distant past Egypt was subjected to severe flooding. This period is usually held to coincide with the melting of the ice from the last Ice Age, ca. 15,000–10,000 B.C.
>
> If it was possible to prove that the Great Sphinx had been eroded by water, and not by wind and sand, it would necessarily mean that it was carved *before* Egypt was under water. This in turn would mean that the greatest sculpture on earth existed at a time when, according to accepted historical theories, there was no civilization on earth, and humanity was in a rudimentary stage of hunters and gatherers. (West 1985, 140; italics in the original)

I realized that West did not quite have the geological timing or mechanism correct. At the time I instinctively choked on the concept that the Great Sphinx could date back to 10,000 BCE or earlier. (Ironically, I now believe the evidence strongly suggests that this is the case.) Egypt had not been literally "under water," had not been covered in a "Noah's Flood" type situation, not at least during the last few tens of thousands of years. It had, however, experienced alternating climatic regimes, with periods of hyperaridity interspersed with periods of more rainy and temperate climatic conditions, and these changing climatic conditions were correlated with the varying global conditions during the last ice age and the period subsequent to the end of the last ice age. The current Sahara Desert, which the Sphinx sits on the eastern edge of, is a relatively recent desert geologically, with hyperarid conditions prevailing for only the last five thousand or so years. Still, five thousand years (going back to ca. 3000 BCE) is at least half a millennium older than the date of circa 2500 BCE the conventional Egyptologists ascribe to the Great Sphinx, and the degree of weathering and erosion (evident even in photographs) on the body of the Sphinx must have been the result of prolonged exposure to rainy conditions, at least on the order of centuries to millennia. So perhaps West was on to something after all. If so, the implications were huge.

And who was this Schwaller de Lubicz whom West was citing? I may have come across the name previously in my diverse reading, but he was not someone whose writings I was directly familiar with at the time. I would get to know his work well.

At the college where I teach within Boston University, there was an English and Rhetoric faculty member at the time, Robert Eddy, who had taught in Cairo and through that connection had come to know West. In due course, West was invited to give a lecture at the college. I attended the presentation. Afterward, Eddy invited West and me to his home for dinner. We talked; I was intrigued. West wanted my geological support for his theories. I was hesitant and rightfully told him that I could not ultimately judge without examining the rocks for myself, which would entail fieldwork in Egypt. Geologists are hands-on types. At the time I thought this rather put the end to the matter. However, West had other ideas, and he arranged for me to partake in an on-site inspection of the Great Sphinx. I made my first trip to Egypt with West in June 1990. It was not to be the last. Subsequent trips allowed me to collect more data, and with Dobecki, subsurface seismic data were collected around the body and in the vicinity of the Sphinx, as well as in selected other areas of the Giza Plateau (see chapter 2).

Plate 1. The Great Sphinx, as seen from between its paws.
(Photo: R. Schoch & C. Ulissey.)

Plate 2. The Great Sphinx at sunset.
(Photo: R. Schoch & C. Ulissey.)

Plate 3. The Great Sphinx facing the morning sunrise, with the full moon simultaneously setting behind the Second Pyramid in the background.
(Photo: R. Schoch & C. Ulissey.)

Plate 4. The Great Sphinx resting in the Sphinx Enclosure during a sandstorm on the Giza Plateau; the Second Pyramid is seen in the background.
(Photo: R. Schoch & C. Ulissey.)

Plate 5. The Great Sphinx with the Sphinx Temple in the foreground and the Second Pyramid in the background.
(Photo: R. Schoch & C. Ulissey.)

Plate 6. The Sphinx Temple, looking toward the southeast.
(Photo: R. Schoch & C. Ulissey.)

Plate 7. Interior of the Valley Temple showing the large granite pillars in the foreground and the heavily eroded and older limestone walls in the far background.
(Photo: R. Schoch & C. Ulissey.)

Plate 8. The Sphinx Temple (foreground) and Valley Temple in the background (south of the Sphinx Temple).
(Photo: R. Schoch & C. Ulissey.)

Plate 9. The northern entrance of the Valley Temple, showing the granite ashlars used to reface the older limestone blocks.
(Photo: R. Schoch & C. Ulissey.)

Plate 10. The Dream Stela, located between the paws of the Great Sphinx.
(Photo: R. Schoch & C. Ulissey.)

Plate 11. Old Kingdom tombs on the Giza Plateau showing wind-induced weathering and erosion, with the Second Pyramid in the background. Note that the rectangular block in the foreground is a modern repair.
(Photo: R. Schoch & C. Ulissey.)

Plate 12. The southern wall and southwestern corner of the Sphinx Enclosure showing the extreme water weathering and erosion from rain and water runoff (an undulating profile with deep vertical fissures). Note the modern repair to one of the fissures.
(Photo: R. Schoch & C. Ulissey.)

Plate 13. Wind-induced weathering and erosion on Old Kingdom tombs on the Giza Plateau illustrating the wind tunnel–like features and desert varnish.
(Photo: R. Schoch & C. Ulissey.)

Plate 14. Water weathering and erosion from rain and water runoff on the southern wall of the Sphinx Enclosure.
(Photo: R. Schoch & C. Ulissey.)

Plate 15. New Kingdom chapel dedicated to the Sphinx in the foreground, with the Great Sphinx and the Third (left) and Second (right) Pyramids in the background.
(Photo: R. Schoch & C. Ulissey.)

Plate 16. The New Kingdom chapel dedicated to the Sphinx.
(Photo: R. Schoch & C. Ulissey.)

Plate 17. The Sphinx and the New Kingdom chapel dedicated to the Sphinx, with Giza in the background.
(Photo: R. Schoch & C. Ulissey.)

Plate 18. The Temple of Isis, where the Inventory Stela was found, with the Great Pyramid in the background. (Photo: R. Schoch & C. Ulissey.)

Plate 19. Statue of Khafre, Egyptian Museum.
(Photo: R. Schoch & C. Ulissey.)

Plate 20. Head of the Great Sphinx.
(Photo: R. Schoch & C. Ulissey.)

Plate 21. Profile of Khafre.
(Photo: R. Schoch & C. Ulissey.)

Plate 22. Fragments of the beard and uraeus of the Great Sphinx in a corner of the Egyptian Museum, Cairo.
(Photo: R. Schoch & C. Ulissey.)

Plate 23. Western wall of the Sphinx Enclosure, with the Second Pyramid in the background and the left rear paw and side of the Sphinx in the foreground.
(Photo: R. Schoch & C. Ulissey.)

Plate 24. View of the western end of the Sphinx Enclosure showing the rear of the Sphinx on the left and the two-tiered western wall on the right.
(Photo: R. Schoch & C. Ulissey.)

Plate 25. The Great Sphinx of Egypt as seen from inside the Sphinx Enclosure.
(Photo: R. Schoch & C. Ulissey.)

Plate 26. Tourists enjoying camel rides near the Great Sphinx.
(Photo: R. Bauval.)

Plate 27. The Great Sphinx, as seen from behind, looking toward the southeast.
(Photo: R. Schoch & C. Ulissey.)

Plate 28. The Great Sphinx, as seen from behind, looking due east.
(Photo: R. Schoch & C. Ulissey.)

Plate 29. Robert Bauval in the Western Desert of Egypt; in the background are yardangs (natural landforms) in the shape of pyramids.
(Photo: R. Bauval.)

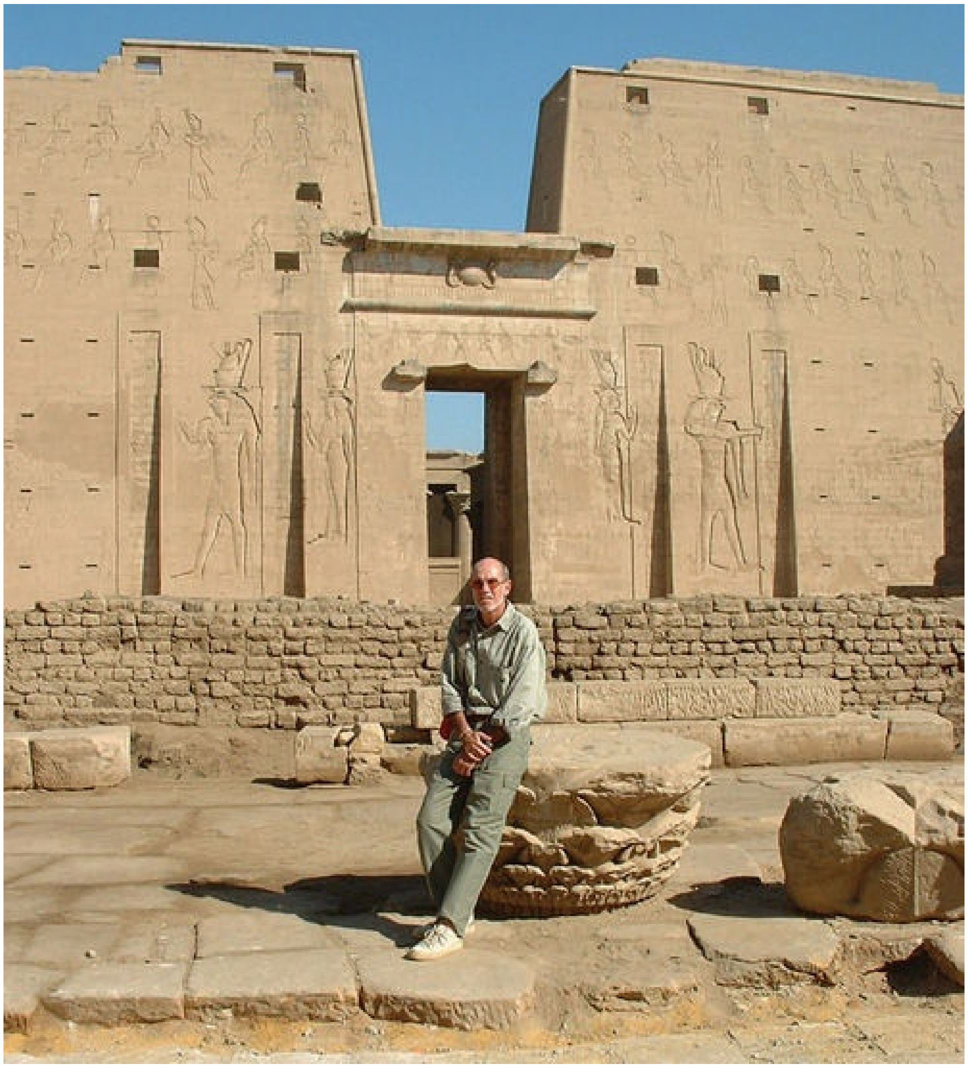


Plate 30. Robert Bauval at the entrance to the Temple of Horus at Edfu.
(Photo: R. Bauval.)

Plate 31. Robert Schoch in front of the Carpathian Sphinx, Romania.
(Photo: R. Schoch.)

Plate 32. Robert Schoch in back of the Great Sphinx at sunrise.
(Photo: Catherine Ulissey.)

Plate 33. Robert Schoch (left) and Robert Bauval (right) enjoying ice cream after a conference in Warsaw, Poland, 2011.
(Photo: Catherine Ulissey.)

Plate 34. Robert Schoch and Robert Bauval examining rocks on location in Bulgaria, July 2014. (Photo: R. Bauval.)

Plate 35. Robert Schoch and Robert Bauval studying an ancient stone circle in Bulgaria, July 2014. (Photo: R. Bauval.)

Bottom line: after studying the Great Sphinx and its associated structures for myself, I was convinced it dates back to an era well prior to dynastic times. We will delve into the detailed geological evidence on which I base my redating of the Great Sphinx shortly. Suffice it to say that key to my redating is the interpretation that the weathering and erosion observed on the body of the Sphinx and the walls of the Sphinx Enclosure are, just as Schwaller de Lubicz noted, not due to the arid desert conditions found in the region during the last five thousand years. Rather, the observed weathering resulted from rain, precipitation, and water runoff; sufficient precipitation was available only during pre-Sahara conditions, prior to circa 3000 BCE. The writing, the evidence, is there on the walls of the Sphinx Enclosure and on the body of the monument itself—written in Mother Nature's own hand. Analyzing and calibrating the subsurface seismic data leads to the same conclusion (see chapter 2).

West and I first formally presented the geological evidence for the redating of the Great Sphinx at the Geological Society of America annual meeting in October 1991. We received rave reviews from the vast majority of my fellow geological colleagues, but then the Egyptologists became involved—and they were livid. In February 1992 a "debate" on the age of the Great Sphinx was held as part of the meetings of the American Association for the Advancement of Science. Dobecki and I represented the geological case for the redating of the Sphinx, while Egyptologist Mark Lehner was the spokesperson for the status quo position that the Sphinx dates to 2500 BCE. Ignoring wholesale the geological evidence, Lehner's argument came down to this (as he stated it at that time), "If the Sphinx was built by an earlier culture, where is the evidence of that civilization? Where are the pottery shards? People during that age were hunters and gatherers. They didn't build cities" (Lehner, quoted in *New York Times* 1992).

The controversy over the age of the Sphinx was making newspaper headlines across the United States and around the world, and it only became more public with the 1993 NBC television airing of the documentary *The Mystery of the Sphinx* (hosted by the late Charlton Heston and including West, Dobecki, and me on-screen). Yet, as I view it, a stalemate over the age of the Sphinx seemed to ensue for the next decade or more. The status quo academics and Egyptologists stuck with their 2500 BCE date, while my colleagues and I continued to assert that the scientific evidence pushed the origins of the Great Sphinx back to a much earlier time period.

Part and parcel to the "problems" concerning the redating of the Great Sphinx were the implications that West had pointed out in his 1979 book *Serpent in the Sky: The High Wisdom of Ancient Egypt*. In *Serpent*, West introduced the English-speaking world to the work of the Alsatian philosopher, mathematician, and founder of the "symbolist" interpretation of ancient Egypt, René Adolphe Schwaller de Lubicz (at the time, Schwaller de Lubicz's works had not yet been translated from French into English). The last chapter of *Serpent* is titled "Egypt: Heir to Atlantis." In it West argues "that [ancient dynastic] Egypt did not 'develop' her civilisation, but inherited it" (West 1979, 197). West elaborates further: "The implications of this alternative are obvious. If the coherent, complete and interrelated system of science, religion, art and philosophy of Egypt [as Schwaller de Lubicz argued was the case, and West details in his book] was not developed by the Egyptians but inherited (and perhaps reformulated and redesigned to suit their needs), that system came from a prior civilisation possessing a high order of knowledge. In other words, this alternative brings up the old question of 'Atlantis'" (West 1979, 197; comments in parentheses in the original; comments in brackets inserted by R. Schoch).

The very word "Atlantis," whether or not in quotes as West used it, sends up red flags in many academic circles. If you want to be taken seriously, you do not want to be associated with the "Atlantologists" or viewed as searching for Atlantis, at least not back when this journey for me began. During my early years researching the Great Sphinx, I refused to refer to the concept of Atlantis by name and privately referred to it as the "A-word" when necessary. Now, decades later, I put more stock in the concept of Atlantis, although not as a specific geographic region or place, but rather in terms of the concept that there was sophisticated civilization before civilization is supposed to have existed according to the standard time frame of conventional archaeological thinking.

As I already stated, from my perspective there was a bit of a stalemate concerning the age of the Sphinx for a decade or so, with each side unswayed by the arguments of the other. This all changed when the site of Göbekli Tepe in southeastern Turkey began to gain the attention of the archaeological community and the general public. West, my wife Katie (Catherine Ulissey), and I first visited Göbekli Tepe in 2010, and Katie and I have been there a number of times since. Göbekli Tepe—an enormous complex of megalithic stone pillars and circles ornately carved and intentionally buried—answers the question posed by Lehner all those years ago (Schoch 2012). Göbekli Tepe is independent evidence (beyond just the redating of the Sphinx) that sophisticated civilization, high culture, existed thousands of years earlier than previously believed. What is more, Göbekli Tepe dates back to the end of the last ice age, circa 9700 BCE, which is in agreement with Plato's chronology of when Atlantis was destroyed by natural catastrophes. And, indeed, there were natural catastrophes at the end of the last ice age, caused I believe (again, based on the evidence) by a major solar outburst or series of solar outbursts (Schoch 2012; see also appendix 9). Here I want to point out explicitly that my best estimate as to dating the origins of the Great Sphinx has changed over the years as more data have accumulated. Originally, in 1990–1991, I was thinking in terms of a time frame of at least the fifth millennium BCE; then I slightly revised my best estimate to circa 7000 BCE to 5000 BCE for the original carving of what would ultimately become (with the recarving of the head and other modifications, such as repairs to the body, paws, and tail) the Great Sphinx. However, this was admittedly a conservative estimate. That is, I acknowledge now that I was essentially pushing my proposed date for the original Sphinx to as recent a time as possible while still holding true (as I saw it) to the geological evidence. But even as early as 1991 some of my geological colleagues rightfully criticized me privately for suggesting too recent a date; the extreme weathering and erosion, combined with the seismic studies, more realistically suggested a much earlier age for the core body of what was to become the Great Sphinx. Furthermore, we now have a much better understanding of what happened at the end of the last ice age and why the civilizations of that time were decimated and all but totally forgotten (with only sporadic remembrances passed down to future generations, such as in legends of a "golden age" and the story of Atlantis). An early cycle of civilization, which arose before the end of the last ice age, was devastated by a solar outburst (or series of outbursts) that ended the last ice age, circa 9700 BCE.

It should be noted that it was not a comet (or meteor or asteroid) that ended the last ice age, as some researchers have incorrectly asserted. It has been suggested in some circles that a comet hit Earth or exploded in the atmosphere circa 10,900 BCE, causing the onset of a 1,200-year cold period—known as the Younger Dryas—before the solar outbursts occurred, resulting in the dramatic warming that ended the last ice age circa 9700 BCE. However, the purported evidence for such a comet has not held up to scrutiny (see appendix 9). I currently suspect that both the beginning and the end of the Younger Dryas (the end of the Younger Dryas marks the end of the last ice age) were caused by variable solar activity. Subsequent to the end of the last ice age, a "solar-induced dark age" (SIDA) ensued for thousands of years, until civilization fully reemerged in the fourth millennium BCE. ("Solar-induced dark age," or "SIDA," is a phrase and acronym that I must credit to my wife, Katie; SIDA can also stand for "subsequent to the ice datum age" for those who prefer a designation that does not include the presumed causal agent, but either way it refers to the same period of time.)

REUSE AND RESTORATION OF AN OLDER SPHINX

Evidence of reuse and restoration of older structures was the first line of data that seriously suggested to me the strong possibility that something was amiss with the then-standard Egyptological dating of the

Great Sphinx to circa 2500 BCE (the time of the reign of the pharaoh Khafre/Chephren). Yes, I immediately noticed the erosional and weathering anomalies on the body of the Great Sphinx and the walls of the Sphinx Enclosure (which are discussed at some length below, and see appendices 6, 7, and 8), but analyzing and drawing conclusions from such weathering and erosion data can be very difficult and is fraught with hazards, which, as a geologist, is something I understand well. Without other forms of corroborative evidence, I would never have voiced publicly the conclusion that the core body, the origins, of the Great Sphinx go back to a much earlier epoch than conventionally believed. Such corroborative material included the evidence of dynastic restoration and the reuse of earlier structures and the subsurface seismic analyses I carried out in conjunction with Dobecki (see discussion in chapter 2). Thus, before we discuss the erosional and weathering data in more detail, let us consider the evidence that the Great Sphinx and associated structures were reused and reworked during the Old Kingdom rather than having been constructed de novo at that time.

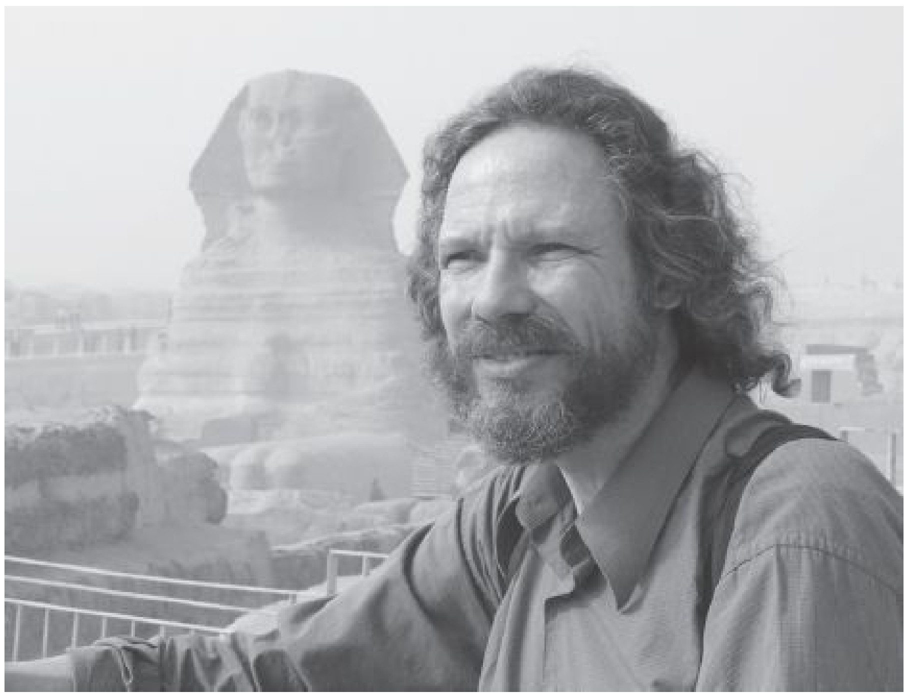


Fig. 7.3. Robert Schoch with the Great Sphinx, December 2012.
(Photo courtesy of C. Ulissey.)

The concept of reappropriation is not a new idea. I came to this conclusion during my earliest studies (1990) of the Great Sphinx of Giza and its associated temples. Egyptologist Selim Hassan, who reexcavated the Great Sphinx in the 1930s, also noted many cases of reuse, including a classic example that he discusses in his 1949 book, *The Sphinx: Its History in the Light of Recent Excavations*: the Hyksos, or Tanis, sphinxes. These are carved stone “sphinxes” (actually more accurately described as lions with human faces; they lack the full human head and headdress of more typical sphinxes), some of which are inscribed with the name of the Fifteenth Dynasty Hyksos pharaoh Apepi (Apopi, Apophis, Ipepi), who reigned in the sixteenth century BCE. Following the Hyksos period, various Tanis sphinxes were reused over and over. An example, now housed in the Egyptian Museum in Cairo, includes cartouches of Apepi, Merneptah (Nineteenth Dynasty, reigned in the late thirteenth century BCE), and Pasibkhanu I (Psusennes I, Pasebxanu I, Twenty-first Dynasty, reigned in the late eleventh century BCE). However, since at least the nineteenth century, it has been suspected that the statues are actually much older than the era of Apepi and were reused during the Hyksos period. Some authors have even suggested that they date to predynastic times, at least 1,500 years earlier. The consensus now appears to be that these sphinxes date to the Middle Kingdom, most likely to the reign of the Twelfth-Dynasty pharaoh Amenemhat III, who ruled during the nineteenth century BCE. Hassan concluded, “The presence of the name of the Hyksos King Apopi, which occurs on some of these sphinxes, is only one of the many usurpations which they have undergone, and re-cutting of the stone can be clearly seen” (1949, 99). Furthermore, these supposed “Middle Kingdom sphinxes” may in fact be reused older statues. “It may be that some of the best specimens attributed to this period [Middle Kingdom] are in reality Old Kingdom [ca. twenty-seventh to twenty-second centuries BCE] work, usurped and altered in detail to meet the prevailing fashion,” Hassan writes (1949, 96).

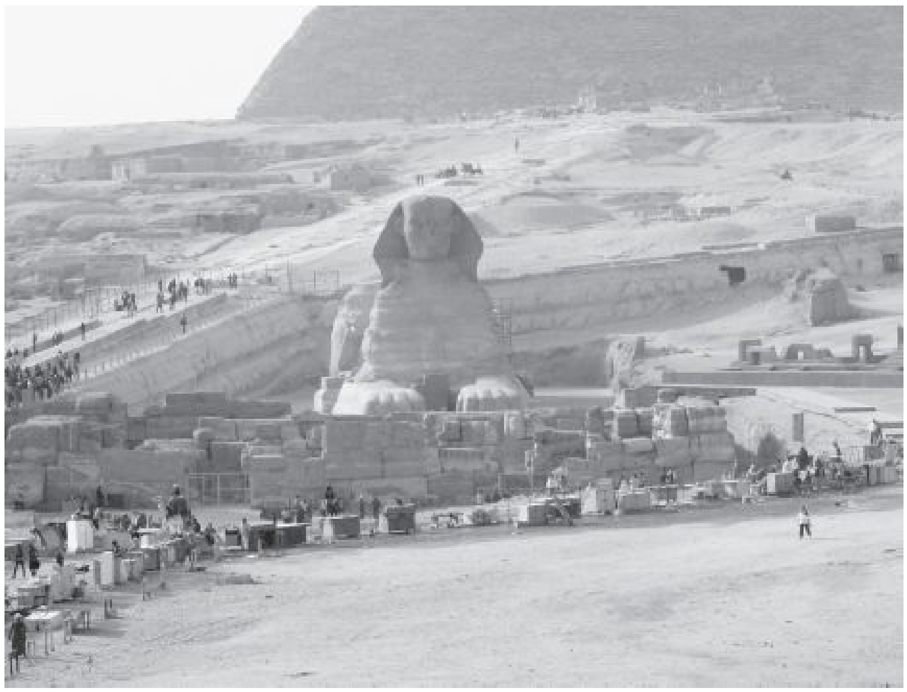


Fig. 7.4. The Great Sphinx with the remains of the Sphinx Temple.
(Photo courtesy of R. Schoch and C. Ulissey.)

It was not only these smaller sphinxes that were usurped, but the Great Sphinx as well. Hassan describes how the Great Sphinx was venerated and “reused” during New Kingdom times, especially under the successive Eighteenth-Dynasty pharaohs Amenophis II (Amenhotep II) and Tuthmoses IV (Thutmose, Thutmosis). (Their reigns spanned the late fifteenth and the early years of the fourteenth centuries BCE.) The cult of the Great Sphinx persisted, being at times more or less popular, for nearly two thousand years. What about the origins and earlier history of the Great Sphinx?

Some early classical Egyptologists (nineteenth and early twentieth centuries) thought the Great Sphinx might trace its origins to well before dynastic times. One such authority was Gaston Maspero (1846–1916), who, among other positions, served for a number of years (1881–1886, 1899–1914) as the director-general of excavations and antiquities in Egypt and was a cofounder of the Egyptian Museum in Cairo (opened in 1902). Maspero suggested that the Great Sphinx is the most ancient monument in Egypt, older than the pyramids and other dynastic structures (see chapter 2).

Returning to Hassan, he ultimately attributed the Great Sphinx to the reign of the Old Kingdom Fourth-Dynasty pharaoh Khafre (Khrafra/Chephren), circa 2500 BCE, the reputed builder of the Second Pyramid on the Giza Plateau (an attribution not original to Hassan). Hassan did honestly note, “As to the exact age of the Sphinx, and to whom we should attribute its erection, no definite facts are known, and we have not one single contemporary inscription to enlighten us upon this point" (1949, 75). Many Egyptologists have contended that a granite stela erected between the paws of the Sphinx by Tuthmoses IV originally contained a portion of the name of Khafre (this part of the inscription has since flaked away), but the context in which Khafre was mentioned (if indeed this referred to the Old Kingdom pharaoh Khafre) has never been clear (see discussion in chapter 3, here). Was he a restorer rather than originator of the Sphinx, or perhaps simply a devotee? Concerning this stela, Hassan wrote in no uncertain terms, "excepting for the mutilated line on the Granite Stela of Thothmes IV [Tuthmosis IV], which proves nothing, there is not one single ancient inscription which connects the Sphinx with Khafra" (1949, 91).

Since Hassan's time the situation regarding the attribution of the Great Sphinx has not changed. No new inscriptions or other definitive material have been uncovered, yet most conventional Egyptologists consider the Khafre/Chephren attribution a "fact." Christiane Zivie-Coche writes, "Today, most Egyptologists agree that the Sphinx was an integral part of the funerary complex of Chephren, whom it depicts in the form of a lion with a human head" (2002, 37). Regarding the notion that the face of the Great Sphinx is that of Khafre/Chephren, this idea was debunked by the detailed analyses of the late facial expert Frank Domingo (1940–2009) in the early 1990s. Domingo, at the time with the New York City Police Department, undertook a detailed comparison of the face of the Sphinx and the face of Khafre based on statues of the pharaoh, concluding that they certainly do not represent the same individual and, indeed, that they do not appear to represent people of the same race or ethnicity (NBC 1993; see also chapter 4, here).

I have posited that the statue has its origins prior to dynastic times (which began approximately five thousand years ago). The proto-Sphinx and its associated "temples" (now commonly referred to as the Sphinx Temple, which sits immediately due east of the Sphinx, and the Valley Temple, situated south of the Sphinx Temple) were reused and refurbished during the Old Kingdom. The head, whomever it may represent, is not the original head but a dynastic recarving; so even if it did represent the image of Khafre, all this would indicate is that Khafre appropriated and reworked an older carving. My initial redating of the Sphinx was based in large part on the weathering and erosion patterns of the carved rock. These bear evidence of heavy precipitation and rain runoff, which is anomalous for the hyperarid Sahara Desert climatic regime that has persisted at Giza for the last five thousand years; thus I suggested that the core body of the original statue must date back to an earlier and wetter climatic period, thousands of years prior to dynastic times. Seismic investigations around the Sphinx support this hypothesis.

Fig. 7.5. Profile of the Great Sphinx as seen from the south showing the disproportionately small head and also the Sphinx Enclosure, Valley Temple, and the New Kingdom chapel that Amenophis II dedicated to the Great Sphinx.
(Photo courtesy of R. Schoch.)

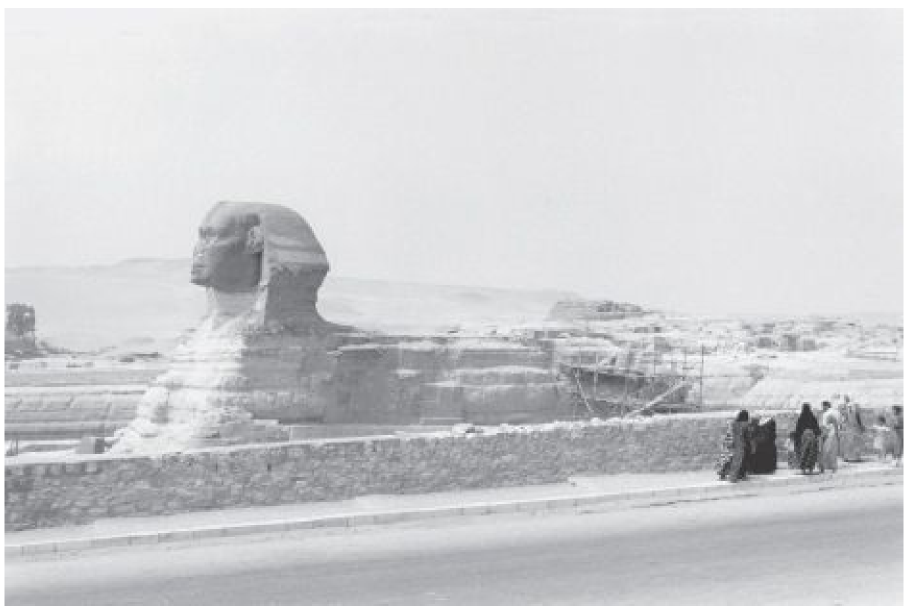


Fig. 7.6. Profile of the Great Sphinx as seen from the north showing the disproportionately small head of the current statue.
(Photo courtesy of R. Schoch.)

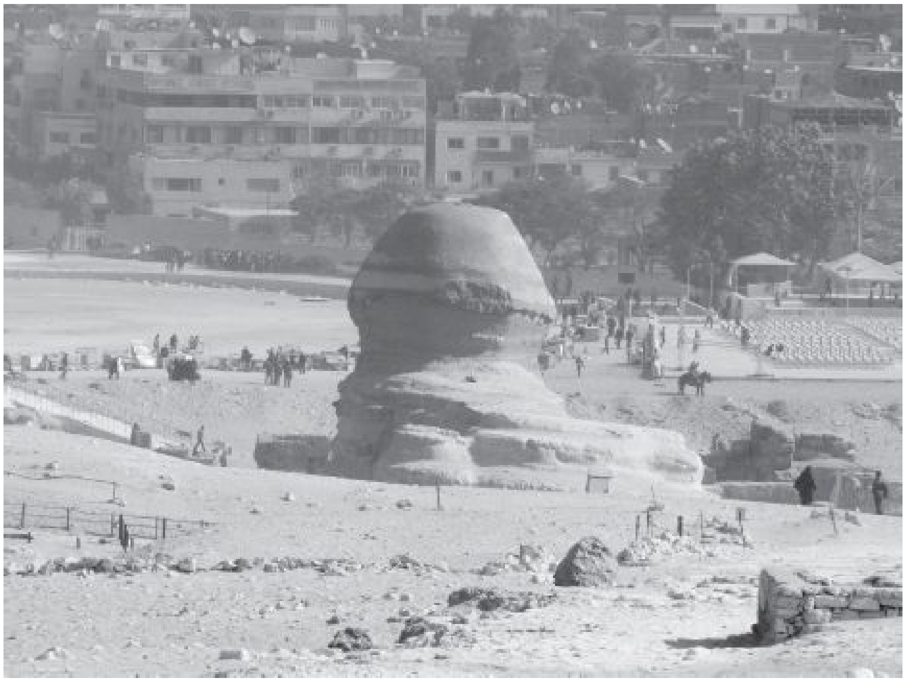


Fig. 7.7. View of the Sphinx from behind, looking east.
(Photo courtesy of R. Schoch and C. Ulissey.)

Important evidence for an earlier Sphinx, along with its associated temples, includes the repair campaigns carried out on the structures during the Old Kingdom (or possibly earlier). The Sphinx Temple and the Valley Temple consist of massive limestone walls faced with somewhat thinner but still massive blocks of granite. It is important to note that the Sphinx Temple (and probably the Valley Temple as well) was built from limestone blocks quarried from the Sphinx Enclosure when the core body of the original Sphinx was carved. Thus, the Sphinx Temple (and most likely the Valley Temple too) is contemporaneous with the original statue we now know as the Great Sphinx. As early as my first trip to Giza in 1990, I concluded that the limestone cores of the temples represent very ancient structures that, subjected to the elements for thousands of years, became weathered and eroded, and were subsequently reworked and restored during the Old Kingdom, perhaps by Khafre circa 2500 BCE, at which time the granite facing stones (exterior and interior, as well as the interior granite pillars of the Valley Temple) were applied. During a January 2015 trip to Egypt, I had an opportunity to reexamine this key evidence and found it as compelling as I did twenty-five years earlier. I also discovered that a native Egyptian Egyptologist, Bassam El Shammaa, apparently independently (he does not cite or otherwise acknowledge my work) recognized the same evidence and came to the same conclusion.

In a bookstall in the Aswan area I found El Shammaa's 2003 book, *Quest for the Truth: The Second Sphinx*. Given the subject matter, I did not hesitate to purchase it. Later, when I had a chance to read through it, I was pleasantly surprised by the author's comments regarding the Valley and Sphinx Temples: "The so-called Valley Temple is a mysterious building hewn, carved and built, I believe, before the pharaohs of the Old Kingdom came into power. It wouldn't surprise me if Egyptians built the Valley Temple together with the adjacent Sphinx Temple before the dynastic era" (El Shammaa 2003, 100).

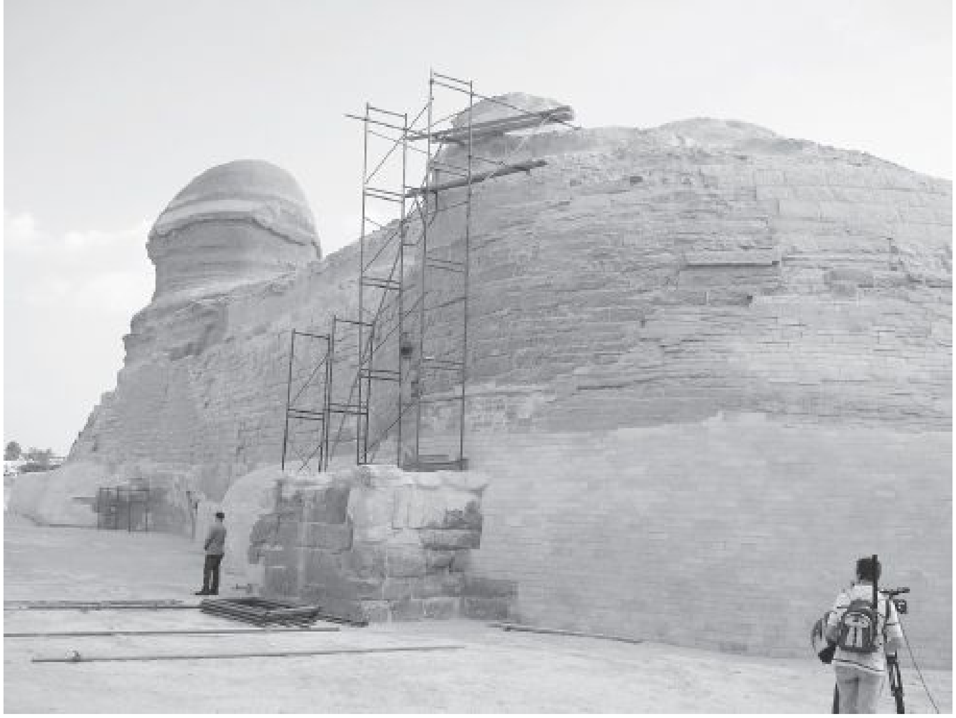


Fig. 7.8. Ancient and modern repairs to the Great Sphinx. In this photograph, as well as in figures 7.9 and 7.10, different repair campaigns can be distinguished by variations in the size, color, and texture of the limestone blocks used. The modern repairs are concentrated on the lower portions, tail, and paws of the Great Sphinx, and the limestone blocks used in the modern repairs are smother and lighter in color than the ancient repairs. Cracks and voids in the head and neck have also been filled in with cement in modern times.
(Photo courtesy of R. Schoch.)

Referring specifically to the Valley Temple, El Shammaa writes:

The original stone [limestone core] is weathered and eroded to such an extent that anyone who looks at it believes that it was exposed for many years to wind, storms and other external natural factors. These factors participated in forming parallel concave erosions and weathering, similar to those which are naturally formed on the body of our surviving Sphinx. By comparing these limestone layers of weathering, to the very well preserved pink granite outer casing, it definitely tells us that both were not exposed to the same natural factors for the same period of time. To prove this thought even further, you will find blocks of granite, carved in a certain shape to precisely fit inside an already weathered limestone wall. The difference between the limestone and the pink granite layers is the difference between both in time. (El Shammaa 2003, 101; material in brackets added by R. Schoch)

Fig. 7.9. View of the northern portion of the Sphinx Enclosure and the northern flank of the Great Sphinx showing various ancient and modern repairs to the Sphinx.
(Photo courtesy of R. Schoch and C. Ulissey.)

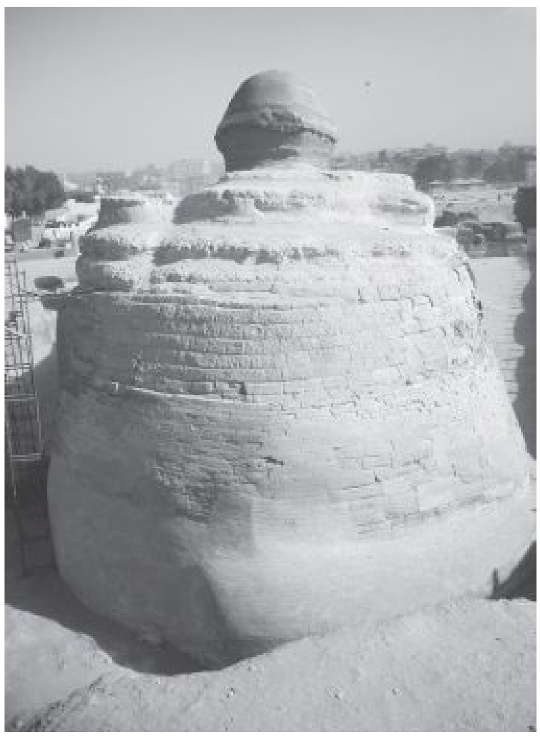


Fig. 7.10. Rump of the Great Sphinx showing the various repair campaigns.
(Photo courtesy of R. Schoch and C. Ulissey.)

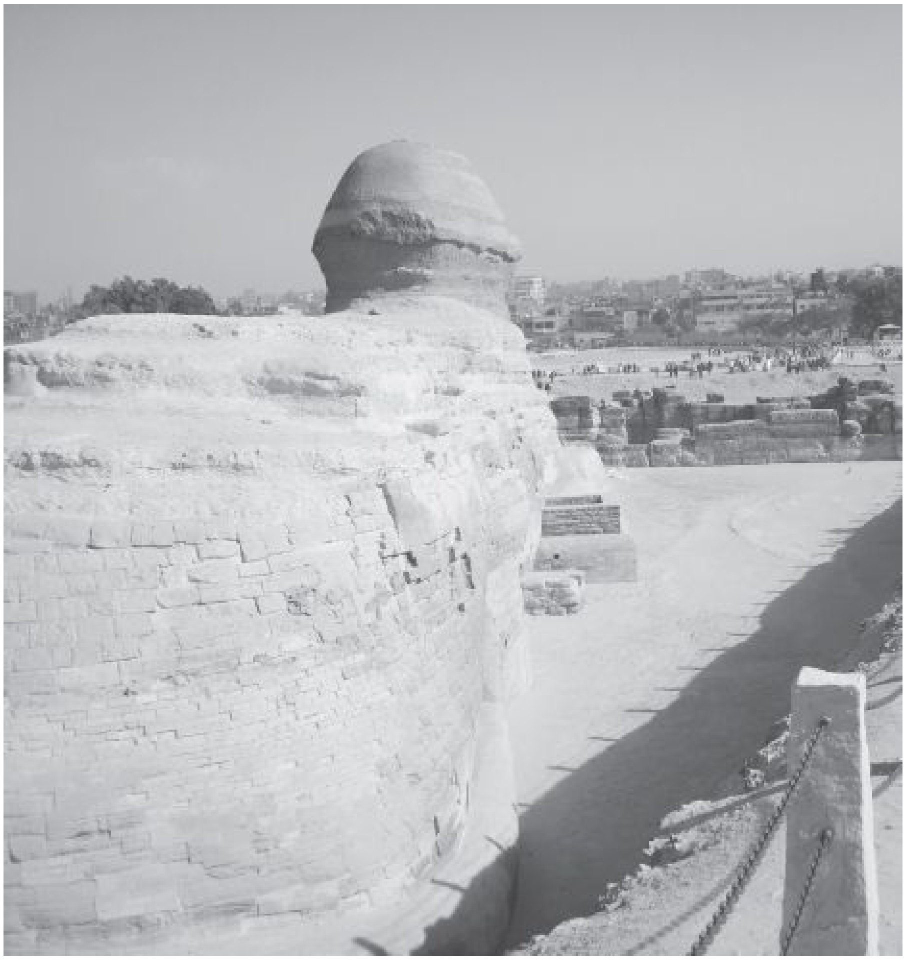


Fig. 7.11. View of the southern flank of the Great Sphinx and the southern portion of the Sphinx Enclosure. (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 7.12. Smooth granite ashlars (Fourth Dynasty?) facing the older weathered and eroded limestone core blocks of the Valley Temple.
(Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 7.13. Inscription found on a granite ashlar of the Valley Temple.
(Photo courtesy of R. Schoch.)

These are very much the same observations I first made in 1990. El Shammaa and most other Egyptologists agree, based in part on an inscription (now highly eroded) found on the granite of the Valley Temple, that the granite outer casing dates to no later than the Old Kingdom. This means the limestone portions of the temples originated much earlier. Furthermore, based on geological analyses, I contend that the limestone blocks used to construct these temples were quarried from around the body of the Great Sphinx when it was carved, thus the temples and the core body of the Great Sphinx date back to the same early epoch. From El Shammaa's book, it is apparent that he believes that the Great Sphinx, as well as a "Second Sphinx" (since destroyed) associated with the Valley Temple, existed prior to the First Dynasty. How long before the First Dynasty, he does not state.

Fig. 7.14. Wall of the limestone core of the Valley Temple with the granite ashlar facing stones removed, revealing the underlying weathered and eroded rock that had been partially recut and "smoothed out" prior to the application of the granite facing stones.
(Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 7.15. The limestone core of the Valley Temple.
(Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 7.16. The limestone core of the Valley Temple as seen from the south.
(Photo courtesy of R. Schoch and C. Ulissey.)

More support for this line of thinking—that the Great Sphinx and its associated temples were rebuilt and reused during the Old Kingdom—comes from a recent paper titled “Surface Luminescence Dating of Some Egyptian Monuments” by Ioannis Liritzis and Asimina Vafiadou (2015). In this article the authors attempt to date various ancient Egyptian structures, including the Valley and Sphinx Temples, using surface luminescence. To give a simplified view of this technique, luminescence (primarily trapped electrons) is built up in a rock due to exposure to ambient radioactivity (from radioactive elements such as uranium and thorium in the rock and the environment, from cosmic rays, and from other sources). This “stored geological luminescence” is released (bleached) when a stone is cut and exposed to sunlight. If freshly cut surfaces of stone blocks are subsequently shielded from sunlight, for instance, deep inside the interior of a wall, they will build up stored luminescence once again. If properly sampled (without exposing the rock to sunlight or other factors that will bleach out the stored luminescence), the stored luminescence can be released and measured in the laboratory, and with appropriate calibration converted to a “date.”

In their paper Liritzis and Vafiadou present six dates taken on samples from the Sphinx and Valley Temples. All of their dates fall broadly within dynastic times, so a superficial reading of their paper might lead one to conclude that their work refutes the contention that these temples, and therefore the Great Sphinx as well, date back to a much earlier epoch. However, I suggest that a more considered review of their data leads to the opposite conclusion.

Before examining the specifics of their six dates, it is important to first note that the authors state clearly that as little as a few minutes of exposure to sunlight can reset the surface luminescence of a rock to zero, so any reworking of a more ancient structure can reset the clock, and the date obtained by surface luminescence dating will be the date of reworking and not the original date. This, I suspect, is the key to resolving discrepancies between their dates and my geological analyses of the structures. Now let us review their dates. On a sample of Valley Temple limestone they calculated a date of 1050 BCE +/− 540 years, and on a sample of Sphinx Temple granite they calculated a date of 1190 BCE +/− 340 years. These two dates are anomalously young, even by conventional Egyptological standards, but they are consistent unto themselves and may indicate reworking of the temples during the New Kingdom, a time when we know that a special interest was taken in the Great Sphinx.

On a sample of Sphinx Temple limestone they calculated a date of 2220 BCE +/− 220 years. I suspect that this sample was exposed or reworked during repairs to the structure during the Old Kingdom.

On a sample of Valley Temple granite they calculated a date of 3060 BCE +/− 470 years. On two samples of Sphinx Temple granite they calculated dates of 2740 BCE +/− 640 years and 3100 BCE +/− 540 years. These dates correspond to a period broadly compatible with the Old Kingdom. It has always been my contention that the granite was added during the Old Kingdom to repair and restore the earlier (much earlier—"Sphinx age") limestone temples. I believe the luminescence "dates" on the granite support this view. The Great Sphinx and its associated temples have a long history, and that history begins thousands of years prior to the rise of dynastic Egypt.

Let us now turn to the argument for an older Great Sphinx that is perhaps most familiar to the general public: the weathering and erosional evidence.

WEATHERED ROCK AND CLIMATE CHANGE

The differing types of weathering and erosion of the rock on the body of the Great Sphinx and on the walls of the Sphinx Enclosure, contrasted with weathering and erosion found elsewhere on the Giza Plateau, is the evidence that many people are most familiar with when it comes to the "older Sphinx theory." Not to oversimplify things, but it really comes down to some fairly elementary geological analyses that are not beyond the level of the typical introductory college undergraduate geology student. However, there are many people who have attempted to confuse and obfuscate the analyses, turning something that is relatively simple into a morass so as to discredit my work (see appendices 6, 7, and 8). Typically, these critics also have a vested interest in maintaining the status quo. Some are professional Egyptologists, archaeologists, or historians who prefer to keep their "stories" intact rather than to have to rethink what they have always believed. In fact, the quotation at the opening of this chapter exemplifies this attitude. Why are my findings "disturbing"? Why is it that the "Egyptological establishment still needs a better response to the questions raised by Schoch" rather than accepting my findings at face value? The quotation is from 1994, but many current Egyptologists still hold this view. Evidently, it is because the Egyptological establishment cannot accept the implications of my research, that advanced culture, civilization, goes back to a period much earlier than previously believed. Others feel that an "older Sphinx" threatens their religious beliefs. Fundamentalist Christians and fundamentalist Muslims have accosted me regarding the age of the Great Sphinx.

Fig. 7.17. View inside the Sphinx Enclosure facing west, showing the northern portion of the Sphinx Enclosure. (Photo courtesy of R. Schoch and C. Ulissey.)

The stone monuments of the Giza Plateau show evidence of two basic kinds or modes of weathering and erosion:

1. Wind-driven sand abrades and scours the stone surfaces, differentially eroding the softer layers while often leaving the harder and more competent layers intact, and in many cases a desert varnish or patina develops on the surfaces of the harder layers. Think of a layer cake with different layers of harder and softer cake, and even softer icing between the layers. On a vertical or near-vertical surface, perhaps a wall, the face of a rock-cut tomb, or the side of a block composing a temple or pyramid, the soft layers are preferentially removed, while the harder layers remain. Wind tunnel–like features develop as soft layers erode away, leaving the harder rock strata above and below where the soft strata once occurred. In a wall this wind weathering and erosion will generally produce an angular profile of recessed softer versus protruding harder layers. These wind-induced processes have been the typical mode of weathering and erosion on the Giza Plateau for the last five thousand years, ever since the Sahara became the hyperarid desert that it is today.
2. Rain and water runoff have a very different effect on the rock. Such precipitation-induced weathering and erosion typically creates a rolling and undulating surface profile, giving the rock in some cases a coved appearance. Vertical fissures may open up along weak joints in the limestone, with the openings of the fissures generally being wider at the tops than at the bottoms. As with wind-driven weathering and erosion, the softer layers of rock typically weather and recede back farther, but since the rain and water runoff bear down on the rock from above and then flow down the rock surface, the uppermost layers often recede back farther than is typical in wind-driven weathering and erosion when comparing the same rock layers, and most diagnostic is the rolling and undulating surface of precipitation-induced weathering and erosion as contrasted with the angular or blocky surface of rock faces weathered and eroded predominantly by the wind.

Fig. 7.18. Wind-induced weathering and erosion seen on Old Kingdom tombs of the Giza Plateau. (Photo courtesy of R. Schoch and C. Ulissey.)

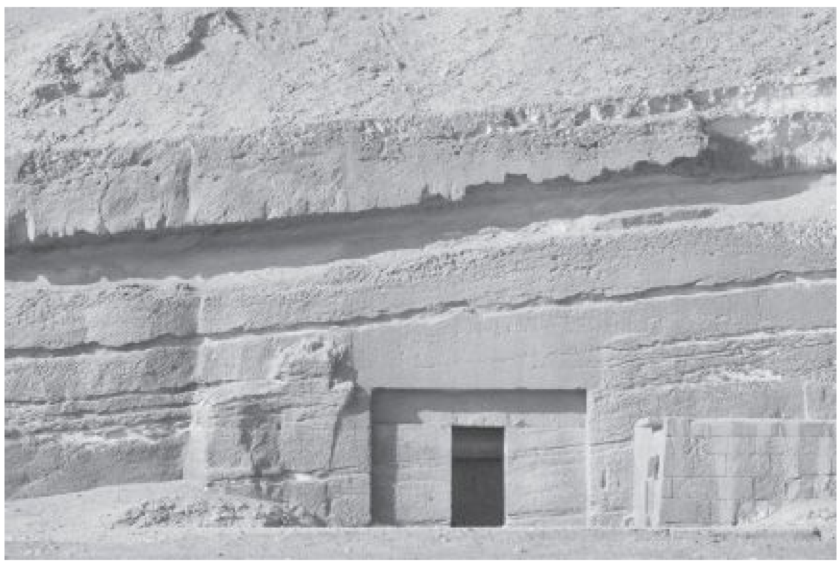


Fig. 7.19. Closer view of wind-induced weathering and erosion seen on Old Kingdom tombs of the Giza Plateau. (Photo courtesy of R. Schoch and C. Ulissey.)

Fig. 7.20. Exterior of an Old Kingdom rock-cut tomb on the Giza Plateau, showing wind-induced weathering and erosion.
(Photo courtesy of R. Schoch.)

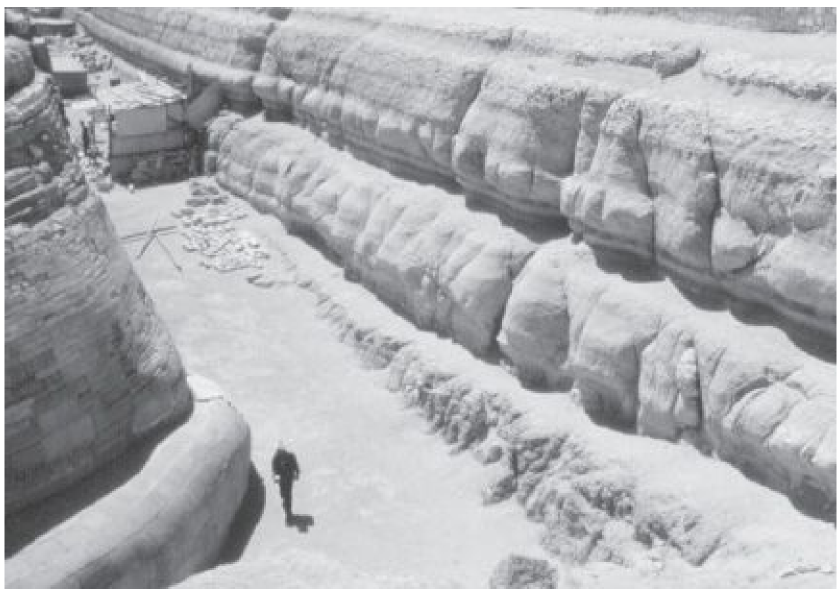


Fig. 7.21. Overview of the precipitation-induced (rain and water runoff) weathering and erosion seen on the southern wall of the Sphinx Enclosure. A portion of the rump and tail of the Great Sphinx is seen on the left.
(Photo courtesy of R. Schoch.)

Fig. 7.22. Precipitation-induced (rain and water runoff) weathering and erosion on the southern wall of the Sphinx Enclosure.
(Photo courtesy of R. Schoch and C. Ulissey.)

These two modes of weathering and erosion are in many cases easily distinguishable on the Giza Plateau, although in a few situations both occur on the same rock face to varying degrees, for instance, where an earlier surface that was subject to precipitation-induced weathering and erosion was subsequently scoured and abraded by wind-driven sand.

Exploring the Giza Plateau, one will find that structures dated unambiguously to the early and middle Old Kingdom (ca. 2600–2300 BCE) and carved from the bedrock limestone (as is the Great Sphinx) show prominent weathering and erosion due to wind and little if any precipitation-induced weathering and erosion. (It does rain occasionally on the Giza Plateau, as I have witnessed.) In contrast, when we examine the core body of the Great Sphinx and the walls of the Sphinx Enclosure, we find striking evidence of precipitation-induced weathering and erosion—in stark contrast to the wind-driven weathering and erosion seen elsewhere on the Giza Plateau. In particular, on the far western and southern walls of the Sphinx Enclosure the rolling and undulating profile is obvious, and large fissures that open wider at the top are present. In the mind's eye one can see the water beating down on the rocks and flowing over the walls of the Sphinx Enclosure. The Sphinx shows evidence of wind weathering as well, but primarily on its head and the very top of its back. The head is, for all practical purposes, a dynastic monument, as it is a recarving of whatever older head may have once been perched on the ancient leonine body. Furthermore, the head sits above the level of the plateau and has been subject to wind-driven weathering and erosion for thousands of years. These wind-induced features are evident in photos of the Sphinx prior to the repairs and restoration to it carried out under the direction of Émile Baraize (1925–1936; see chapter 2). As far as we know, the head of the Sphinx was never fully buried in sand. The body of the beast, as well as the walls and the interior of the Sphinx Enclosure are another matter. As we have discussed (chapter 2), if left unattended the Sphinx Enclosure can fill with sand in just a matter of decades, burying the statue up to its neck. The sand served to protect the ancient precipitation-induced weathering and erosion, which has unfortunately been degraded and damaged over the last two centuries with the numerous modern excavations and restorations of the Sphinx; additionally, modern pollution, such as acid rain, from the heavily populated city of Cairo is taking its toll on not only the Great Sphinx, but all of the Giza monuments.

As Schwaller de Lubicz noticed, the weathering of the Great Sphinx and its enclosure is not compatible with the current arid regime of the Giza Plateau; thus, it may be that the Sphinx goes back to an earlier period with a different climatic regime. The alternative, the scenario insisted on by conventional Egyptologists, is that on the Giza Plateau very strange things occur when it comes to the weathering and erosion of the monuments. Some limestone structures, these Egyptologists insist, weathered and eroded in a manner that appears to have been caused by rain and water runoff, while at the same time other limestone structures degraded in a manner that appears to have been wind driven. On the face of it, this seems illogical and ridiculous! Rather, if all of the structures are of approximately the same age (here we are considering reputedly Old Kingdom structures, not the later structures that are also found at Giza) and were subject to the same climatic and weathering conditions, then they should all show broad similarities in their major weathering and erosional features. To get around this logical quandary, various Egyptologists, archaeologists, and their supporters and apologists have come up with numerous ingenious and complicated scenarios in attempts to explain away the weathering and erosional discrepancies and maintain the assertion that the Great Sphinx dates to the Old Kingdom. Not only are many of these arguments incredibly convoluted (and I cannot help but think of the cliché of medieval theologians arguing over how many angels can dance on the head of a pin), but various Egyptologists and their supporters also contradict one another. Therefore, even by their own standards, some of their theories must be wrong. (See appendices 7 and 8 for some of their arguments.)

The simplest explanation, in my opinion, is that the Great Sphinx and the undoubted Old Kingdom structures (such as well-dated rock-cut tombs) are from different periods that experienced significantly different climatic regimes.

Fig. 7.23. Robert Schoch with the precipitation-induced (rain and water runoff) weathering and erosion on the southern wall of the Sphinx Enclosure.
(Photo courtesy of R. Schoch and C. Ulissey.)

In a nutshell, the Giza Plateau is located on the eastern edge of the Sahara Desert, which is a relatively recent desert by geological standards; its most recent hyperarid regime set in only about five thousand years ago (or by some accounts, even a bit later). Prior to circa 3000 BCE what is now desert experienced alternating periods of temperate to rainy climatic conditions interspersed with more arid conditions. My initial conclusion, which I continue to maintain, is that the core body of the Great Sphinx, the walls of the Sphinx Enclosure, and the limestone cores of the Sphinx Temple and Valley Temple date back to a pre-Sahara—before circa 3000 BCE—climatic regime. Not only does the Great Sphinx date back to such an earlier climatic regime, but also it must go far enough back into such an earlier period to account for the substantial precipitation-induced weathering found in particular on the walls of the Sphinx Enclosure. I have estimated that up to a meter or more of rock may have been eroded from these walls in places; such a high degree of weathering and erosion would require a substantial amount of time under any realistic climatic scenarios. Just how long is difficult to estimate based simply on surface features, but my initial estimate was on the order of several millennia prior to the onset of the current hyperarid Sahara conditions. Using the subsurface seismic data, this estimate is confirmed, and I currently am of the opinion that the core body of the Great Sphinx dates back to before the end of the last ice age (that is, before ca. 9700 BCE). Thus, the oldest portions of the Great Sphinx and its associated structures are contemporaneous with the amazingly sophisticated archaeological site of Göbekli Tepe in southeastern Turkey, the oldest portions of which also date back to the early tenth millennium BCE (or possibly earlier). It is important to point out that the excavations at Göbekli Tepe, which were to reveal its age and significance, did not even begin until several years after I had carried out and announced my findings relative to the dating of the Great Sphinx (see Schoch 2012).

CORROBORATION

As we have discussed throughout this book, there are numerous lines of evidence all pointing to the same conclusion: the civilization that first recognized the “solar complex” (discussed in chapter 5) memorialized in the monuments of the Giza Plateau had its origins in a very early period indeed, a period that dates back before the end of the last ice age (ca. 9700 BCE). The evidence of the Orion correlation theory (OCT; see chapter 6) suggests a date of circa 10,500 BCE. But archaeoastronomical correlations combined with interpretations of ancient inscriptions and myths only go so far to demonstrate that there really was an advanced civilization some twelve thousand years ago. What is demanded by the doubters is physical evidence, actual tangible material that can be examined. Yet we have had such evidence before our eyes all along! Despite the depredations of time and man, the Great Sphinx remains the seemingly eternal sentinel of our very ancient heritage.

EPILOGUE

Robert M. Schoch

When we began work on this book, we considered making the following comment in chapter 1: “The jury is still out on what or who the Great Sphinx represents and, more importantly, how old it really is.” Perhaps, we reasoned, this would be a good way to open the book and introduce the reader to the controversies surrounding the Great Sphinx; however, the concept of a jury and a courtroom is not strictly applicable in this case. Theories and hypotheses in science—and thus, ultimately, all those “facts” that come to be incorporated into the larger “common body of knowledge”—are not decided by juries or popular votes. Science is decidedly undemocratic; not everyone’s opinion carries equal weight. Only evidence and opinions backed by evidence count.

In this book we have marshaled and analyzed the evidence regarding the Great Sphinx. Personally, we have both devoted significant portions of our lives to this endeavor, enduring mental and physical hardships, as we have come under attack from skeptics, debunkers, scoffers, and all those who would uphold the conventional status quo view concerning the origins of civilization, and the origins of Egyptian civilization in particular. But we have done our best to pursue the quest as objectively as possible, always following the evidence wherever it may lead, whether it supports our original ideas or not.

We have taken into account the work of the most prominent Egyptologists of the last two centuries; their theories are neither consistent one to another nor account for all of the data. We have meticulously studied the ancient inscriptions, myths, and theologies, and found the standard interpretations lacking. We have looked at forensic comparisons of the face of the Great Sphinx with that of its reputed builder, the pharaoh Khafre, and found that the features do not match. We have analyzed the archaeological context of the Great Sphinx and found the standard story to be incomplete. We have investigated the archaeoastronomical alignments of the monuments on the Giza Plateau and found they fit best an epoch that preceded the Old Kingdom by thousands of years. We have assessed the various types of weathering and erosional features seen on the Great Sphinx and its associated structures; they do not match the hyperarid Sahara Desert regime that has prevailed for the better part of the last five millennia. Probing beneath the surface of the bedrock with seismic techniques, we have revealed new information.

Whether turning our eyes to the sky, looking back at the past, evaluating the archaeological material, mentally peeling away layer upon layer of exposed surface rock, or probing into the subsurface of the bedrock, in our assessment one conclusion is inescapable: the magnificent monument we now know as the Great Sphinx was not created de novo during the Old Kingdom Fourth Dynasty, circa 2500 BCE. Rather, its origins go back much earlier—many millennia earlier—and it was appropriated, restored (including a recarving of the head), and reused during Old Kingdom times. Unequivocally, the original statue—the core body of the Great Sphinx—belongs to an earlier epoch and an older civilization.

On the Giza Plateau a very ancient “solar complex” was memorialized, which, combined with a later “stellar phase,” represents *zep tepi*— the “first time.” While conventional Egyptologists, archaeologists, and historians generally regard the whole idea of zep tepi as mythical, we have made the case that it is not only a true historical period, but it can also be dated. The stars in the sky, as interpreted through the reconstructions of archaeoastronomy, and the physical evidence of the stones on the ground, as analyzed through the lens of geology, point to the millennium prior to the end of the last ice age, that is to the eleventh millennium BCE, or circa 10,500 BCE, as the actual date of zep tepi. This period represents an earlier cycle of high culture, a primordial civilization, that flourished during the final phase of the last ice age but subsequently collapsed, no doubt due to the climatic, biotic, and geological changes that accompanied the dramatic warming that ended the ice age, circa 9700 BCE. This earlier civilization did not fully disappear, however; through the survivors and their descendants, it was remembered in myths and legends, in theological references and rituals, for nearly seven thousand years, when the Egyptian civilization we refer to as “dynastic” or “pharaonic” came to prominence. The dynastic Egyptians revered the peoples and “gods” of zep tepi, and they acknowledged and honored as sacred the physical remains—such as the core body of the Great Sphinx and its associated limestone temples—that survived from the zep tepi epoch, incorporating them into their own building plans on the Giza Plateau. Thus, we have at Giza not only zep tepi memorialized in astronomical alignments, but here too we have preserved physical remains dating back to the time of this early high culture. This surely is hallowed ground, a sacred site of transformation and rebirth, a place where gods were born. This we must understand and acknowledge. The Old Kingdom Egyptians knew as much.

Fig. E.1. The Great Sphinx with the Great Pyramid in the background, circa 1870s (?), from a glass lantern slide, published by [J.] Lévy & Cie Sucrs. de Ferrier P. F. & Soulier, Paris. (Collection of R. Schoch.)

APPENDIX 1

The "Paradigm Police" and the Upside-Down Worldview of an Authoritative "Expert"

Robert Bauval

They call themselves The Committee for the Scientific Investigation of Claims of the Paranormal [CSICOP]. In fact they are a group of would-be debunkers who bungled their major investigation, falsified the results, covered up their errors and gave the boot to a colleague who tried to tell the truth.

DENNIS RAWLINS, PHYSICIST AND COFOUNDER OF CSICOP, NOW KNOWN AS THE COMMITTEE FOR SKEPTICAL INQUIRY (CSI)

The criticism of Bauval's pyramid alignment claims seems to me to involve two assumptions: first, that an amateur cannot make a valid scientific observation or discovery; second, that ancient societies cannot be credited with motives or objectives that appear sophisticated. Both of these assumptions are, of course, false.

CHANDRA WICKRAMASINGHE, PH.D.

It is dangerous to be right in matters on which the established authorities are wrong.

VOLTAIRE

Summary: On November 4, 1999, the BBC's *Horizon* program broadcast a documentary titled *Atlantis Reborn*. In this documentary appeared Edwin Krupp, Ph.D., director of the Griffith Observatory in Los Angeles, who claimed that I, Robert Bauval, had "turned Egypt upside down," that is, had disingenuously turned the map of Egypt around in order to make my Orion correlation theory (OCT) "fit." And even though a few months previously I had been interviewed by the BBC for this documentary and given the opportunity to vent my response to Krupp's serious and damaging accusation, my response was deliberately omitted when the documentary was aired. A complaint was lodged against the BBC to the Broadcasting Standards Commission (BSC). When it was discovered that Krupp was a longtime member of the international skeptics organization known as the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP, now known as the Committee for Skeptical Inquiry) and also its affiliate body, the Council for Media Integrity (CMI), this provoked a huge scandal involving senior executives of the BBC, an eminent British astronomer, physicists, and the national media in one of the most public cases handled by the BSC.

This is the in-depth story of this bizarre affair . . .

OUT OF THE WOODWORK

Since the publication of my first book (*The Orion Mystery*, 1994), the OCT has been featured in dozens of television programs around the world and also reviewed and discussed in numerous articles in popular magazines, scientific journals, books, periodicals, newspapers, conferences, and, eventually, more than two hundred thousand websites. (It even has its own Wikipedia entry.) To put it more concisely, the OCT has acquired a life of its own or, in today's Internet jargon, has gone viral. Contrary to the persistent contention of some academics that the OCT is "fatally flawed," the OCT is very much alive and has become part of pop culture. But like all new theories or new ideas that generate such enthusiastic interest in the public and heated debates worldwide, the OCT has had its inevitable share of imitators, opponents, and critics and, more disturbingly, has attracted the anger (often disguised as "criticism") of professional debunkers posing as experts and skeptics organizations that resemble an intellectual modern version of the Spanish Inquisition. One such expert is the good doctor Krupp. I feel justified in the retelling here of the 1999 Krupp-instigated media controversy in view of the new and revealing information about this strange affair that has recently come to light.

But first some background:

I developed the OCT in 1983 while I was working as an engineer in the Middle East. My first reaction was to inform Egyptologists and astronomers of the theory. These were the pre-Internet days, so I communicated with these scholars by postal mail. Among the scholars informed were T. G. H. James, Ph.D., then the keeper of Egyptian Antiquities at the British Museum; Sir I. E. S. Edwards, the foremost authority on the Egyptian pyramids and previous keeper of Egyptian Antiquities at the British Museum; Jaromir Málek, Ph.D., director of the Griffith Institute at the University of Oxford; and Richard Parker, Ph.D., professor of Egyptology at Brown University and the foremost authority on ancient Egyptian astronomy; as well as a few others. Eventually, with the help and recommendation of Edwards, I managed to get a paper on the OCT published in 1989 in the Oxford journal *Discussions in Egyptology*, edited by Alessandra Nibbi, Ph.D. In 1994, the OCT was then presented again in my first book, *The Orion Mystery* (coauthored with Adrian Gilbert), which was coupled with the BBC documentary *The Great Pyramid: Gateway to the Stars* (February 1994). Two years later, in 1996, I expanded the OCT to include the Great Sphinx and presented this work with Graham Hancock in our book *Keeper of Genesis* (*Message of the Sphinx* in the United States).

It was, I think, more than anything else, the airing of the BBC documentary *The Great Pyramid: Gateway to the Stars* that touched the proverbial sensitive nerve of the academics and skeptics at that time. This documentary reached an estimated seven million people in the United Kingdom alone and was also distributed to dozens of television channels around the world, with millions of other viewers exposed to this allegedly controversial theory. In the United States, it was shown on the A&E Network channel, and soon after, in March 1995, ABC's *Primetime Live* show (now called *Primetime*) aired a special on the OCT.

Such exposure was bound to ruffle the proverbial feathers of experts in Egyptology and ancient astronomies. It was not just because I was an outsider with no Ph.D. to my name and thus perceived as an amateur, but also because of the various distinguished scholars who had participated in the BBC documentary, including Edwards as well as Vivian Davies, Ph.D., then the keeper of Egyptian Antiquities at the British Museum; Virginia Trimble, Ph.D., then vice president of the International Astronomical Union; Mary Brück, Ph.D., professor of astronomy at the University of Edinburgh and wife of the ninth astronomer royal for Scotland, Hermann Brück; Jean Kerisel, Ph.D., president of the Franco-Egyptian Society and one of France's most highly decorated civil engineers; and Ali Hassan Ph.D., head of the Egyptian Supreme Council of Antiquities, all of whom were either caught off balance or were unable to falsify the theory outright. Inevitably, an assortment of experts and debunkers soon began to take potshots at the OCT.

Constructive criticism quickly turned to abuses in the media, with labels put on me of "pseudoscientist," "charlatan," "pyramidologist," "pyramidiot," and so forth. The most vocal against my person was the head of Egyptian Antiquities, Zahi Hawass, Ph.D., who had a field day with the local and international media. There were, as is often the case with such things, a plethora of amateur debunkers on the Internet who aggressively attempted to sully the OCT or, along with it, my integrity and reputation. All this was with the general intention to attempt to sway the general public from supporting the OCT and, in the case of Egyptologists, to safeguard the established consensus of what the pyramids and the Great Sphinx represent and, more pertinently, their stated age. But when all these attacks did not produce the desired effect with the public, it was now time for *professional* debunkers to join the fray.

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL AND THE COUNCIL FOR MEDIA INTEGRITY

In those early days I was unaware of CSICOP, let alone that it had just recently created the CMI, nor could I have known that Krupp, one of its most senior members, had taken personal offense to the OCT.[*44]

Krupp made his first public "attack" on the OCT in February 1997. This was in the form of an article published in the popular magazine *Sky & Telescope* under the title "Pyramid Marketing Schemes." Krupp bluntly accused me of having placed "the map of Egypt upside down," allegedly to make the OCT work.[†45]

Not satisfied with just a quantitative "criticism" of the OCT, Krupp resorted to the use of patronizing statements disguised as humor, such as, "It is unlikely the three pyramids of Giza are stand-ins for the stars. For all I know, they may symbolize the Three Blind Mice, the Three Graces, the Three Musketeers, the Three Wise Men, or the Three Stooges. But I don't think they are the three stars of Orion's Belt."[‡46] In November 1999, Krupp's views were taken to a much higher level when the BBC's *Horizon* program invited him to participate in a documentary titled *Atlantis Reborn,* in what was clearly a bid to debunk the OCT.

Fig. A1.1. Edwin Krupp, Ph.D.

THE BACKGROUND

A CSICOP "attack" as seen from the receiving end is like a modern version of an auto-da-fé. But instead of zealous priests exposing and punishing heretics, we have zealous skeptics who are bent on exposing pseudoscientists and charlatans publicly.

CSICOP was created in 1976 by a group of scientists, science editors, and academics headed by Paul Kurtz and including such science luminaries as Carl Sagan. It has its headquarters at Amherst, New York, and today boasts a worldwide network of skeptics from academic establishments and the scientific media. Its main objective is to "maintain a network of people interested in critically examining paranormal, fringe science, and other claims, and in contributing to consumer education." As the Inquisition of the Catholic Church is regarded today as a repulsive, authoritative, and arrogant establishment that saw itself as the custodian of the truth and that ostracized anyone who did not conform to its dogmas, I believe so will CSICOP in some distant future be seen in that way. Because inevitably all such establishments, no matter how lofty were their original intentions, will eventually degenerate into intellectual witch hunts. The most notorious CSICOP cases involved the Israeli "spoon bender" Uri Geller and the French psychologist Paul Gauguelin, both of whom were viciously hounded in the media by the committee (Rawlins 1981, 67–98; Misset 2009, 224–26; Grov 2009, 329–30).

Another such hounding involved a most senior CSICOP member, Sir John Maddox, with his aggressive debunking of British biologist Rupert Sheldrake, Ph.D., when the latter published his book *A New Science of Life: The Hypothesis of Formative Causation* (Sheldrake 1981). Maddox had been the longtime editor of the prestigious science journal *Nature* and is listed in CSICOP's official "Pantheon of Skeptics" (Committee for Skeptical Inquiry 2016b). Immediately after Sheldrake's book appeared in bookshops, Maddox went on British TV with these shocking words:

> I [Maddox] was so offended by it [Sheldrake's book], that I said that while it's wrong that books should be burned, in practice, if book burning were allowed, this book would be a candidate. . . . I think it's dangerous that people should be allowed by our liberal societies to put that kind of nonsense into currency. . . . You see, Sheldrake's is not a scientific theory. Sheldrake is putting forward magic instead of science, and that can be condemned, with exactly the language that the popes used to condemn Galileo, and for the same reasons: it is heresy. (Maddox 1981, 245–46)

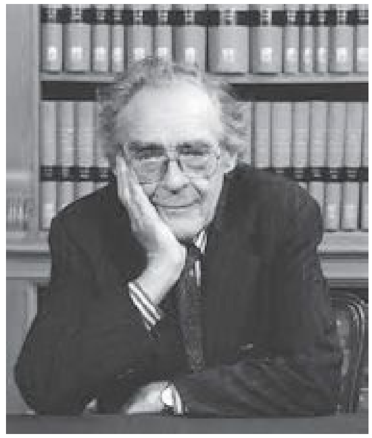


Fig. A1.2. Sir John Maddox.

Let us note in passing that it was also Maddox who wrote an editorial in *Nature* titled “No Need for Panic about AIDS,” saying, “For strictly prophylactic purposes, male homosexuals should be persuaded to change their ways. . . . The pathetic promiscuity of male homosexuals is the most obvious threat to public health, but is probably no more serious now than it was before homosexuality ceased to be illegal.” Maddox then described AIDS as a “perhaps non-existent condition” (Maddox 1983, 749).

When my first book, *The Orion Mystery*, was published in February 1994 by one of Britain’s most prestigious publishing houses, William Heinemann of Reed Books, it received media attention that was not normally given to this genre of nonfiction publication. The media were mostly open and positive, some even enthusiastic, about the OCT, and there were, too, rave reviews for the accompanying BBC documentary, *The Great Pyramid: Gateway to the Stars*. Within days *The Orion Mystery* was on all the bestseller lists in the United Kingdom, reaching the number 1 position in *Publishing News* and number 2 in the *Sunday Times*. To add fuel to the fire, *The Orion Mystery* was followed in 1995 by Graham Hancock’s number 1 *Sunday Times* bestseller *Fingerprints of the Gods*, and then in 1996 by our joint book *Keeper of Genesis*, also a number 1 *Sunday Times* bestseller. All this was bound to catch the attention of ultraskeptics the likes of Maddox.

It was about that time that the first World Skeptics Congress took place in Buffalo, New York, in the summer of 1996, which was where Maddox and other CSICOP members created the CMI. This is from the CMI’s own website: “The Council for Media Integrity was founded in the summer of 1996 at the First World Skeptics Congress, held at the State University of New York at Buffalo. The Council is comprised of a network of distinguished international scientists, academics, and members of the media concerned with the balanced portrayal of science in the media” (Committee for Skeptical Inquiry 2016b).

WAS THE ORION CORRELATION THEORY ON THE HIT LIST OF THE COUNCIL FOR MEDIA INTEGRITY?

Until 1997, which was three whole years after the publication of *The Orion Mystery*, no scientists, academics, or even the most determined debunkers had pointed out that the map of Egypt had to be “turned upside down” in order for the OCT to work. Yet by his own admission Krupp knew about *The Orion Mystery* since its publication in 1994. He said, “When *The Orion Mystery* came out my curiosity was naturally aroused. Anybody coming up with a good idea about ancient astronomy I wanted to know about it” (BBC 1999).

But if the OCT had such a glaring discrepancy of maps being deliberately fudged to make it work, as claimed by Krupp, then the question is why no Egyptologist, astronomer, astrophysicist, physicist, or indeed anyone else saw it before Krupp did in 1997. Was it because no one else saw a discrepancy? But even more pertinently, why did Krupp wait more than three whole years to point out this alleged discrepancy?[*47]

Let’s look at the chronology of the facts:

1989: The OCT is published in *Discussions in Egyptology.*

February 1994: The OCT is presented in my book *The Orion Mystery.*

February 1994: The OCT is presented in the BBC documentary *The Great Pyramid: Gateway to the Stars.*

March 1995: The OCT is presented on television in the United States on ABC’s *Primetime Live.*

September 1996: CSICOP forms the CMI. Krupp joins the CMI.

February 1997: Krupp’s article “Pyramid Marketing Schemes” is published in *Sky & Telescope.*

The facts, as they say, are speaking for themselves . . .

ATLANTIS REBORN . . . AGAIN

In January 1999, Hancock informed me that the BBC’s *Horizon* team wanted to arrange for an interview with me in Egypt. Hancock had been working with them on a program that, he was told, would be an honest and balanced critique of his work and the theory of a lost civilization in remote antiquity. Although Hancock had a few misgivings about getting involved in such a program, he nonetheless felt confident that the *Horizon* team would be fair and would allow us to present our own side of the case properly and not place our comments out of context. I agreed with Hancock and decided to also participate in this program. *Horizon,* after all, was the BBC’s most prestigious scientific program. It has been on the air for more than thirty-five years, and, according to the BBC website, it was “the world leader in its field” and “regularly wins a sweep of international science, medical and environmental film accolades, and has recently won the Royal Television Society Awards and the Prix Italia” (BBC 2016).

The producer for this project was Chris Hale, a well-known documentary filmmaker. His assistant and researcher on this particular project was a young man called Julian Hudson. I was first contacted by Hudson in late January 1999, and I agreed to be interviewed in Egypt by Hale in early March. The interview took place in the early morning on the elevated south side of the Giza Plateau. Hale himself conducted the interview and was assisted by Hudson and two British technicians who operated the camera and the sound recording equipment, as well as by two Egyptian technicians from a local TV production company. I had asked the American author John Lash to accompany me in order to record the interview with my personal video camera. This was to prove a very vital exercise when looking with hindsight at what later happened . . .

Many viewers who saw the BBC *Horizon* program *Atlantis Reborn* on November 4, 1999, did not realize that it was in fact a sequel to *Atlantis Uncovered*, which had aired the previous week on October 28. Clearly, these two documentaries were primarily aimed at debunking Hancock's lost civilization theory as presented in his bestselling book *Fingerprints of the Gods*. The first one was to sugarcoat the audience by showing how the BBC was giving Hancock a fair trial, as it were. It was the second documentary that revealed the true debunking intention of the BBC. In any case, and because the OCT was an important aspect of the lost civilization theory, the BBC had, by necessity, to also find a way to debunk it. And that was where Krupp comes in.

Whether the BBC knew of Krupp's long-term affiliation with CSICOP and his recent affiliation with the CMI cannot be ascertained with certainty now. But the fact that the BBC also recruited another well-known CSICOP debunker, the Canadian anthropologist Ken Feder, makes it hard to believe that they didn't know of either man's membership in this international skeptics organization.

Fig. A1.3. Ken Feder, Ph.D.

Here is the relevant part of the official transcript of the *Atlantis Reborn* documentary:

BBC NARRATOR: If Bauval and Hancock are right the implications are astounding. It means that Ancient Egyptian civilization was inherited from a lost people, unknown to any mainstream historian. One astronomer took a keen interest in Bauval's theory—Ed Krupp. He quickly became troubled by Bauval's claims.

ED KRUPP: When *The Orion Mystery* came out my curiosity was naturally aroused. Anybody comes up with a good idea about ancient astronomy I want to know about it and in going through the book there was something nagging. In *The Orion Mystery* there's a, a nice double page spread and anybody looking at this would say ah, Giza pyramids, belt of Orion, one kind of looks like the other, you know you've got 3 in a row, 3 in a row, slanted, slanted, we've got a map and what I was bothered by turned out to be really pretty obvious. In the back of my head I knew that something was wrong with these pictures and what's wrong with these pictures in their presentation is that north for the constellation of Orion is here at the top of the page. North for the Giza pyramids is down here. Now they're not marked, but I knew which way north was at Giza and I knew which way north was in Orion. To make the map of the pyramids on the ground match the stars of Orion in the sky you have to turn Egypt upside down and if you don't want to do that then you've got to turn the sky upside down.

Fig. A1.4. The BBC's Horizon documentary Atlantis Reborn, *with Ed Krupp saying, "You have to turn Egypt upside down."*

Here is the response to Krupp's "upside-down" commentary I gave the BBC when they interviewed me in Egypt in March 1999, but which was deliberately omitted from the documentary when it was aired in November of that year.

> Well, first one must realize that the Egyptians directed themselves south. We know that from the texts and it is logical for two reasons: one is that the Nile, which was the dominant feature of this land, flowed from south to north, so the origin or source of the Nile [which is in the south] was regarded as a sacred place. [Second] the movement of the astral bodies, the stars [or Orion], the moon, the sun, are all around the southern side of the sky. So it was natural for them to face south. And in fact there is no reason to fix north as a main direction. This is a convention that we have today. So the Egyptians had a "convention" of south, if you like. But the other thing is that in order to make the correlation visual because we are dealing with people who had a visual correlation, of course. You are observing the stars at their southern passage, so in about 2500 BC they had risen to about 45º along the southern meridian. And indeed at their low point—in 10,500 BC they were in the lower south, that is the lower part of the sky in the south. So you're looking south at the correlation. Therefore the natural tendency is to draw what you see in that direction, and you would come up with three stars in that pattern or three dots or three pyramids or any three marks in the same direction. It is strange that certain astronomers have argued this in terms of [a modern] convention. We can't graft this convention of today on an [ancient] people who had a different way of looking at things. So it's very simple . . . if you were to design by observation you would look south. You will have to look south because you will have to look at the stars and, therefore, on the ground you'll be marking the stars, and the Menkaure pyramid will be on top of your diagram, which is the way it is, the southernmost. In order to apply the convention of north, you will have to look in the other direction, and to see the stars you will have to use a mirror! So I don't see why we have to go through these complications when, pretty clearly, we have a correlation based on visual observations. Actually we did a test, as a matter of fact, during a conference when Ed Krupp was there. We asked the audience to look at a slide of the stars in the south, and we gave them a piece of paper and we asked them to draw three dots [representing Orion's belt], and they did so by having the smaller dot [the "smaller star"] [representing] the Menkaure pyramid, if you

like, at the top of the sheet. And then we told them "you are facing south!" That's the way you do it. It's a natural way of creating a perfect correlation. They were going for image correlation; they weren't going for "convention." This simple litmus test proves that everybody will do the same thing if they are not biased by that "convention."[*48] (I have here added some words in square brackets for clarity.)

The scandal that ensued was not just that the BBC did not use my response (even an abbreviated or edited version of it would have been acceptable), but also that they deliberately refrained from mentioning anything of the cultural, archaeological, and astronomical issues that would support the OCT, such as (1) the alignment of the southern shaft of the King's Chamber in the Great Pyramid directed to Orion's Belt, (2) the passages in the Pyramid Texts that speak of the king traveling to his afterlife destiny in Orion, (3) the relative positions of Orion's Belt to the Milky Way (celestial river) and of the Giza pyramids to the Nile, (4) the "star names" given to Fourth Dynasty pyramids at Abu Ruwash (viz., "Djedefre [the pharaoh] is a star in the sky") and at Zawyat el Aryan (viz., "Nebka [the pharaoh] is a star"). Without such a context the BBC made it sound as if I had picked any three stars at random simply because they conveniently matched the pattern of the three Giza pyramids! All the BBC did say that "Bauval had an inspiration," giving the false impression to viewers that there was no evidence to support the OCT other than "an inspiration." It was clear to me that the true intention of the BBC was to make the OCT look like a figment of my imagination, and in doing so they would leave it as a sitting duck for Krupp.

BBC NARRATOR: There's always been a mystery about the 3 Giza pyramids. Looked at from above they form a perfect diagonal, but with the third, smaller pyramid that is offset. Many have been baffled by this curious imperfection, but now there is a new explanation. Robert Bauval is a former engineer. He has developed a controversial theory about the Giza pyramids and it has a crucial role in the evolution of Hancock's theories about a lost civilisation. In 1982, on his way to Cairo airport, Bauval flew over these mysterious wonders of the Ancient World. There was something about the puzzling layout of the pyramids *that began to obsess him.* (italics added)

ROBERT BAUVAL (AUTHOR): Now if you can see you have two large pyramids which are of almost equal size and a long diagonal line whereas the third pyramid, the smaller one, of Menkaure, is offset to the east of this diagonal.

BBC NARRATOR: *Bauval had an inspiration.* The plan of the three pyramids reminded him of a constellation—Orion the Hunter. In the middle of the constellation are the 3 belt stars. They, too, form a diagonal line with one star offset. It seemed to be a perfect match for the pyramids. (italics added)

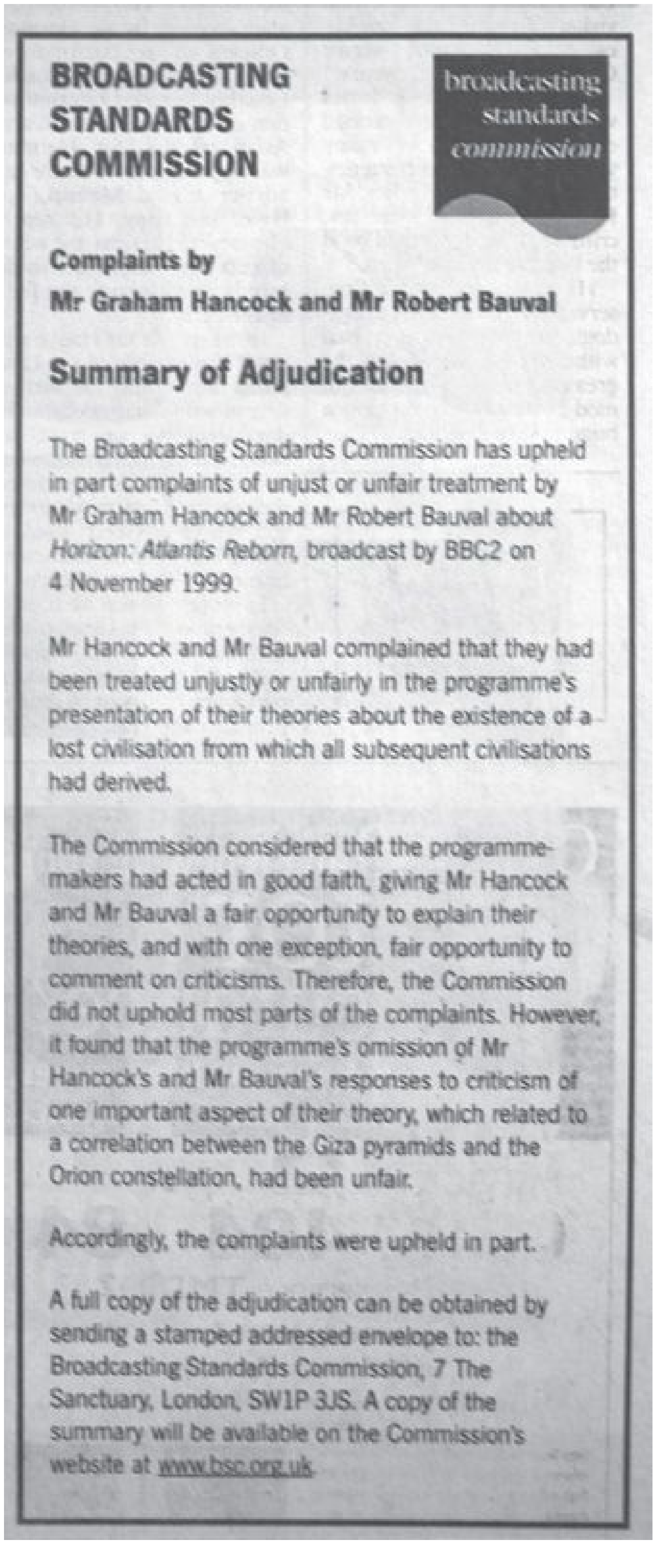
ROBERT BAUVAL: I observed that the stars had exactly the same pattern as the pyramids on the ground. You have two bright stars, or two large stars if you like, and the third one on the top dimmer and offset to the east in exactly the same pattern.

BBC NARRATOR: There are, of course, many other stars in Orion, but it was the three belt stars that led Bauval to make another discovery, one that linked the pyramids uncannily with that date long in the past. As a result of precession, the angle of the three stars changes over time and Bauval found the best fit on one particular date.

BBC NARRATOR: One astronomer took a keen interest in Bauval's theory—Ed Krupp. He quickly became troubled by Bauval's claims.

Anyone who knew the true arguments that I had presented in my book *The Orion Mystery* could see that the BBC had been totally unfair to me, not to say disingenuous.[*49] This hatchet job was in full contravention to the broadcasting standards code of "fairness" that was required of the BBC under its charter, and there was no doubt in my mind that Hancock and I had been set up by the BBC or, as I now strongly suspect, by the producer, Hale, and his assistant, Hudson. In any case, we obviously couldn't just take such outrageous debunking and unfair treatment lying down. There was only one thing for us to do: lodge a formal complaint at the BSC.

It took a year to get a final adjudication from the BSC. But finally, in September 2000, the BSC announced that the complaint had been upheld on the issue of Krupp's "upside-down" comments, and consequently the BBC was forced to publish a summary of the adjudication in the *Times of London* newspaper and also preceding a rebroadcast of the documentary *Atlantis Reborn*, which now included my counterview to Krupp's accusations. The adjudication appeared in the *Times* on December 14, 2000, and the documentary, now retitled *Atlantis Reborn Again,* was aired that same evening.



BROADCASTING STANDARDS COMMISSION

broadcasting standards commission

Complaints by
Mr Graham Hancock and Mr Robert Bauval

Summary of Adjudication

The Broadcasting Standards Commission has upheld in part complaints of unjust or unfair treatment by Mr Graham Hancock and Mr Robert Bauval about *Horizon: Atlantis Reborn*, broadcast by BBC2 on 4 November 1999.

Mr Hancock and Mr Bauval complained that they had been treated unjustly or unfairly in the programme's presentation of their theories about the existence of a lost civilisation from which all subsequent civilisations had derived.

The Commission considered that the programme-makers had acted in good faith, giving Mr Hancock and Mr Bauval a fair opportunity to explain their theories, and with one exception, fair opportunity to comment on criticisms. Therefore, the Commission did not uphold most parts of the complaints. However, it found that the programme's omission of Mr Hancock's and Mr Bauval's responses to criticism of one important aspect of their theory, which related to a correlation between the Giza pyramids and the Orion constellation, had been unfair.

Accordingly, the complaints were upheld in part.

A full copy of the adjudication can be obtained by sending a stamped addressed envelope to: the Broadcasting Standards Commission, 7 The Sanctuary, London, SW1P 3JS. A copy of the summary will be available on the Commission's website at www.bsc.org.uk.

Fig. A1.5. The Summary of Adjudication from the Broadcasting Standards Commission.

Dodging the Opposition?

Several weeks before the rebroadcast of Atlantis Reborn I had contacted Ed Krupp in order to solicit his support to persuade the BBC to interview Mary Brück, Ph.D., or Archie Roy, Ph.D., who had kindly offered to intervene on my behalf against his accusations. Krupp declined to help, saying he'd rather leave the matter for the BBC to decide. Here are my comments to him:

"The matter ended with an "unfair" adjudication from the Broadcasting Standards Commission [against the BBC],

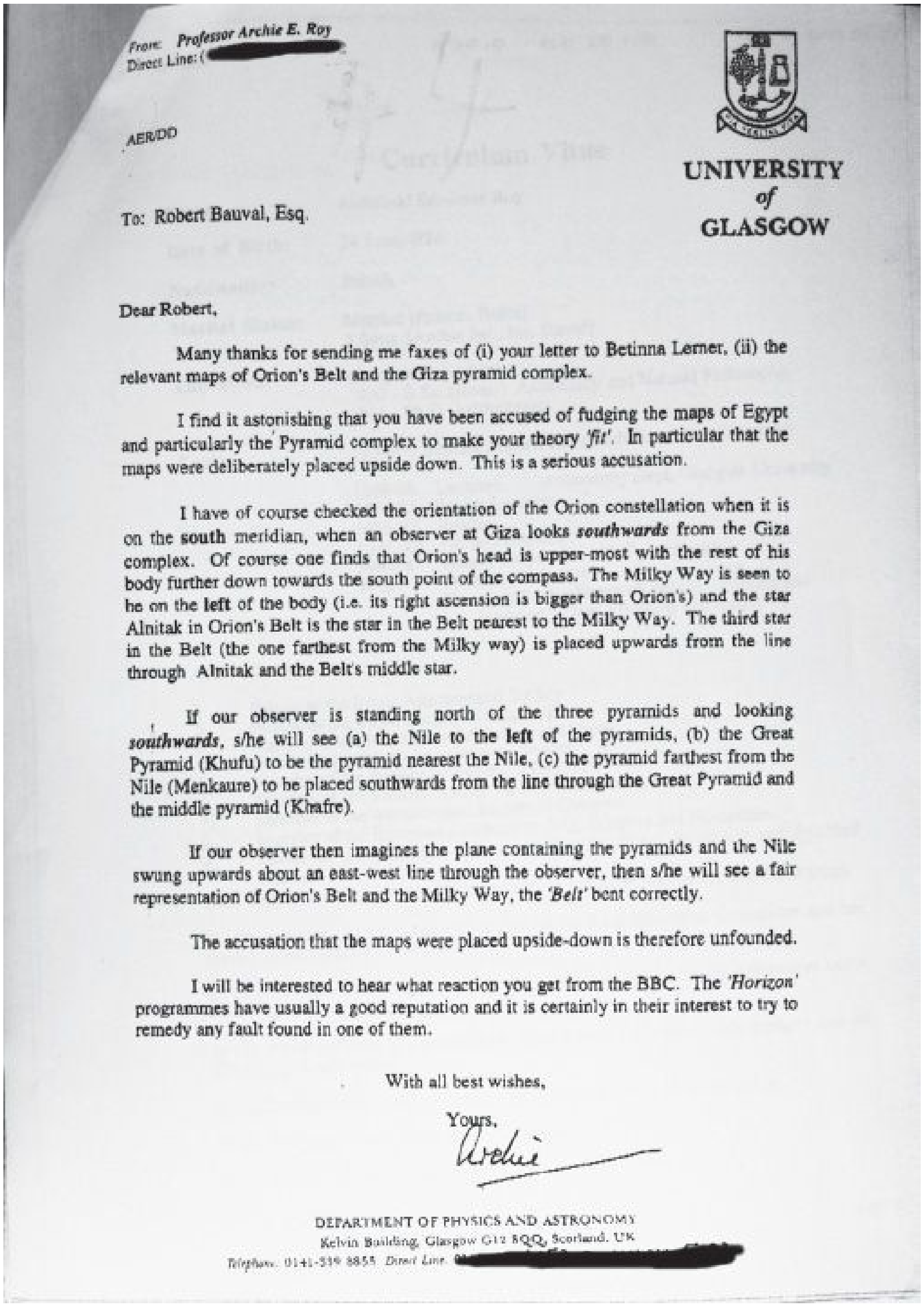
> and now everyone—and surely also yourself as an unbiased academic—want to see fairness done. I am, therefore, much dismayed that you will not support my motion to have a reputable British astronomer give a counterview to your comments on the new BBC *Horizon Atlantis Reborn* . . . considering that it has received full support in writing from at least three very senior astronomers (not to mention many other professionals and a very wide general public) who have dismissed your "upside down" argument as unfounded, wrong, invalid and unfair . . . (I could e-mail you their written rebuttals if you wish) . . . is it possible that you feel that only your view should be heard in the BBC program? Would it not be scientific—let alone fair play—to support my motion to have another astronomer voice his views?"

Needless to say, the BBC did not include Brück or Roy on the program or even bother to contact them; for had they done so, this would certainly have greatly undermined the damage they clearly had intended to inflict from the outset on the OCT. The BBC did, how-ever, use part of my interview given in March 1999, but with their own narrator, Dilly Barlow.

After the airing of *Atlantis Reborn* (November 1999) Krupp posted on the Internet the following statement, putting in doubt the veracity of my claim about the opposition to his accusation by Roy:

> In 1999, Robert Bauval, coauthor of *The Orion Mystery* and *The Message of the Sphinx*, enlisted the astronomical support of astronomer Dr. Archie E. Roy in an effort to diminish the impact of the astronomical analysis I had performed on *Bauval's* interpretation of the layout and meaning of the monuments on the Giza plateau. Dr. Roy's comments on one element of my analysis have been quoted by Robert Bauval, and those who have encountered them would naturally be interested in an assessment of their validity and relevance. This report is intended to respond to that interest. I am addressing the remarks Robert Bauval attributes to Dr. Roy. I have not discussed these matters directly with Dr. Roy and cannot confirm that Robert Bauval has accurately quoted him. I first detected logical conflicts in The Orion Mystery in 1995, when I was writing *Skywatchers, Shamans, & Kings: Astronomy and the Archaeology of Power*, and I described *one of those contradictions—directional inversion*—briefly in a section about pyramids in that book. I also offered a condensed presentation of the argument in the February, 1997, installment ("Pyramid Marketing Schemes") of my monthly column on astronomy and culture for *Sky & Telescope* magazine. I dealt with another aspect of the Bauval/Hancock Giza mapping in a second *Sky & Telescope* column, "The Sphinx Blinks," in March, 2001. In May, 1998, allied with Zahi Hawass, I participated in the Visions Travel "The Pyramids, the Sphinx, the Mystery" cruise through Alaska's Inside Passage. The Visions Travel group had been put together with the promise of a Giza Mystery "debate," with Hawass and me on one side and Robert Bauval, Graham Hancock, John Anthony West, and others on the other. Robert Bauval, however, was not able to make the trip. In my shipboard presentation, I spotlighted seven serious astronomical problems with the Bauval/Hancock interpretations of Giza. Most of the subsequent coverage has focused, however, on one issue—my complaint that Bauval, and later Hancock, made Giza map Orion by turning Egypt upside-down. There are, however, other serious astronomical problems as well. (italics added) (Krupp 2001a)

Figure A1.6 presents the report by Archie Roy (1924–2012); Krupp disingenuously implied that I may have not "accurately quoted" Roy's statements in this letter.



From: Professor Archie E. Roy
Direct Line: [redacted]

AER/DD

To: Robert Bauval, Esq.

UNIVERSITY
of
GLASGOW

Dear Robert,

Many thanks for sending me faxes of (i) your letter to Betinna Lerner, (ii) the relevant maps of Orion's Belt and the Giza pyramid complex.

I find it astonishing that you have been accused of fudging the maps of Egypt and particularly the Pyramid complex to make your theory *'fit'*. In particular that the maps were deliberately placed upside down. This is a serious accusation.

I have of course checked the orientation of the Orion constellation when it is on the **south** meridian, when an observer at Giza looks ***southwards*** from the Giza complex. Of course one finds that Orion's head is upper-most with the rest of his body further down towards the south point of the compass. The Milky Way is seen to be on the **left** of the body (i.e. its right ascension is bigger than Orion's) and the star Alnitak in Orion's Belt is the star in the Belt nearest to the Milky Way. The third star in the Belt (the one farthest from the Milky way) is placed upwards from the line through Alnitak and the Belt's middle star.

If our observer is standing north of the three pyramids and looking ***southwards***, s/he will see (a) the Nile to the **left** of the pyramids, (b) the Great Pyramid (Khufu) to be the pyramid nearest the Nile, (c) the pyramid farthest from the Nile (Menkaure) to be placed southwards from the line through the Great Pyramid and the middle pyramid (Khafre).

If our observer then imagines the plane containing the pyramids and the Nile swung upwards about an east-west line through the observer, then s/he will see a fair representation of Orion's Belt and the Milky Way, the *'Belt'* bent correctly.

The accusation that the maps were placed upside-down is therefore unfounded.

I will be interested to hear what reaction you get from the BBC. The *'Horizon'* programmes have usually a good reputation and it is certainly in their interest to try to remedy any fault found in one of them.

With all best wishes,

Yours,

Archie

DEPARTMENT OF PHYSICS AND ASTRONOMY
Kelvin Building, Glasgow G12 8QQ, Scotland, UK
Telephone: 0141-339 8855 *Direct Line*: [redacted]

Fig. A1.6. Open letter from Archie Roy, Ph.D., regarding the "upside-down" accusation by Ed Krupp.[*50]

Fig. A1.7. Astronomer Archie Roy, Ph.D.

Roy was not alone in complaining about Krupp's unfair debunking tactics. Many British astronomers and physicists who had heard about *Atlantis Reborn* also vented their disapproval of the BBC's debunking tactics. Among them were Mary Brück of the University of Edinburgh, Percy Seymour of Plymouth University, and Chandra Wickramasinghe of Cardiff University.[*51] Also University of Cambridge astrophysicist Chris Doran asked the BBC to "remove Ed Krupp's comments about the Giza array being 'upside down,'" and Doran's colleague at the Cavendish Laboratory, David MacKay, graciously informed me that I had his "full support on this issue." MacKay also kindly provided me with a "supporting statement in the form of a cartoon" (see figure A1.8).

In appendix 2 I will review the *technical aspects* of Krupp's criticism and also those by another OCT critic, Anthony Fairall, Ph.D., of the University of Cape Town, who also appeared in the BBC documentary.

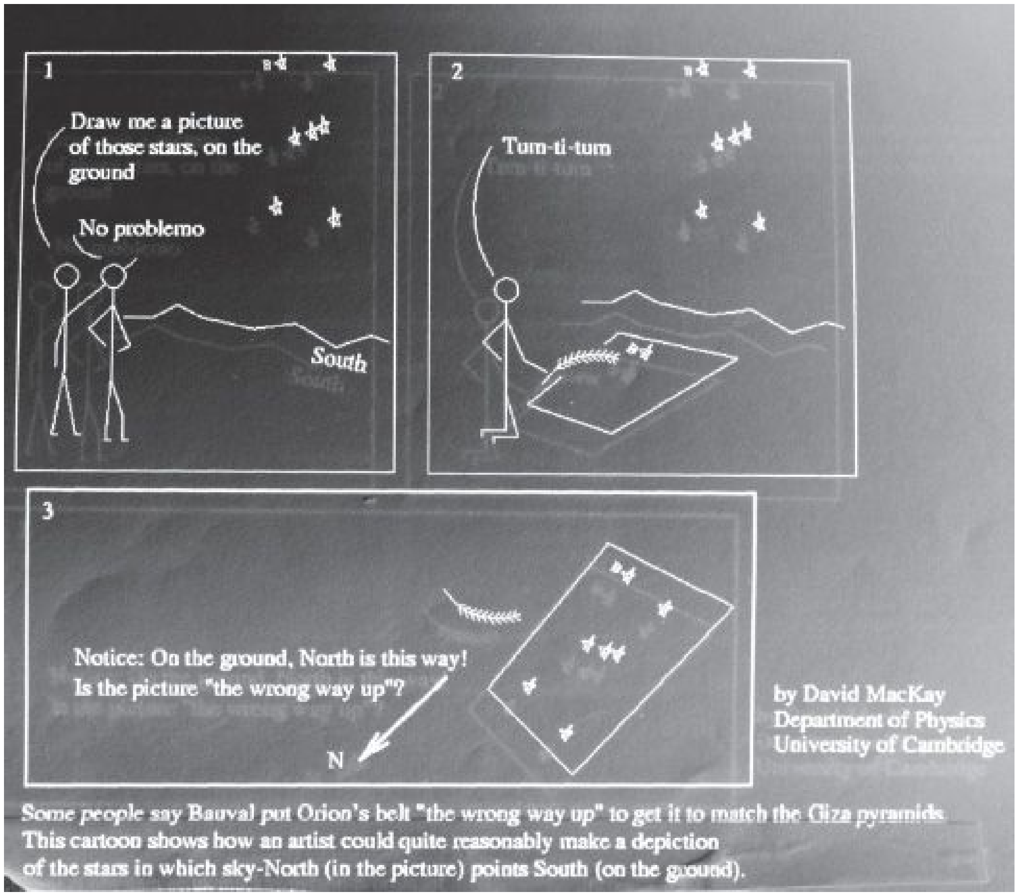


Fig. A1.8. Cartoon by David MacKay, Fellow of the Royal Society.

POSTSCRIPT

In March 2014 Krupp again brought up his “upside-down” and “directionality” criticism of the OCT on the History Channel’s *The Universe, Ancient Mysteries Solved: Pyramids*. However, other astronomers were on the show to give a counterview. Alex Filippenko, Ph.D., an astrophysicist from the University of California, Berkley, stated, “That’s [the OCT] an interesting hypothesis. It sort of depends on how you look at Orion. The Belt stars align if you look at it one way, and don’t align if you look at it another way. So we don’t really know if it is correct.” Bryan Penprase, Ph.D., an astrophysicist at Pomona College (after listening to the narrator explain how one of the shafts in the Great Pyramid had pointed to Orion’s Belt, the belt stars of Orion, and state that this constellation was associated with Osiris) also added, “Osiris was the god of the Afterlife, he presided over the seasons, the cycle of life and death, so he was one of the most important figures of all of the Egyptian pantheon. The Pyramid points toward the culmination of that constellation in the sky, and this connects the pyramid with the sky in a very important way” (History Channel 2014). They were all careful, however, not to mention my name, nor was it listed in the acknowledgments.

I close this appendix with a small digression: Roy was asked why academic skeptics behaved in this negative and aggressive manner toward the OCT. His reply was (and I quote), “I think that many of the most productive ideas are first of all as *the man’s mad!* Second, *alright, let’s look at these ideas and show where the error is,* and the third stage for many advances is *of course I always knew this to be true*” (Oostra 2004; italics added).

APPENDIX 2

The Orion Correlation Theory: Can It Be Falsified?

Robert Bauval

The theory known as "The Orion Correlation Theory" was first proposed by Robert Bauval . . . and although the validity of this theory is still disputed, it is at present the most convincing hypothesis aimed to explain the enigmatic and clearly not due to simple chance disposition of the Giza pyramids.

GIULIO MAGLI, PH.D.,
PROFESSOR OF APPLIED MATHEMATICS
AT MILANO POLITECNICO

The OCT has been subjected to some quantitative astronomical and astrophysical verifications, in order to assess its compatibility with the results of both naked-eye astrometry and photometry. . . . According to these analyses it is possible to conclude that the OCT is not incompatible with what is expected for the stars of the Orion Belt on the basis of naked-eye astrometry and photometry, as well as of the stellar evolution theory . . . our tests were not able to falsify the OCT.

VINCENZO OROFINO, ASSOCIATE PROFESSOR,
DEPARTMENT OF MATHEMATICS AND PHYSICS,
UNIVERSITY OF SALENTO

HOW WOULD ORION'S BELT BE LOGICALLY REPRODUCED ON THE GROUND?

In the summer of 1993 I had the good fortune to make the acquaintance of the distinguished astronomer Mary Brück (1925–2008), the wife of the German-Scottish astronomer royal for Scotland, Hermann Brück (1905–2000). Mary and I met when I was writing my first book, *The Orion Mystery*. I had gone to visit her and her husband at their home in Penicuik Estate near Edinburgh. Mary had offered to help me in my investigation to find the so-called Dixon Relics from the Great Pyramid that had been brought to

Scotland in 1872 by the engineer John Dixon for Charles Piazzi Smyth, the astronomer royal for Scotland at that time. She had in her possession some important information that she had found in the personal diary of Piazzi-Smyth (Bauval 2001).

Fig. A2.1. Astronomer Mary Brück, Ph.D., and Robert Bauval at the Glasgow Science Center, 2001. (Photo courtesy of Robert Bauval.)

When in February 1994 the BBC aired the documentary *The Great Pyramid: Gateway to the Stars*, based on my book *The Orion Mystery*, Mary was interviewed by the producer, Chris Mann, and asked to give her opinion on the Orion correlation theory (OCT). She said:

> The layout of the three pyramids, just speaking as an astronomer, is very reminiscent of the pattern of the three stars as in the Belt of Orion. There's no question about it. For a start the three pyramids appear to be equidistant just as the three stars in the constellation of Orion are equidistant, with the third star slightly offset from the other two and slightly fainter as well just as the third pyramid is slightly smaller and slightly offset from the line of the other two. It's certainly a very intriguing idea, there's no question about it. (BBC2 1994)

Several years later, in 1999, when the BBC *Horizon* program aired *Atlantis Reborn*, in which Ed Krupp Ph.D., director of the Griffith Observatory in Los Angeles, made his "upside-down" accusation against me (see appendix 1), Mary, like many other British astronomers and physicists at the time, protested about the way the BBC had allowed this unfair accusation to be made without a counterview, and she wrote this statement for the BBC:

> The layout on the ground of the three pyramids of Giza matches closely the pattern of the three stars in Orion's belt i.e. a row of three, the third and most westerly in both cases being offset slightly anticlockwise from the line of the other two. Furthermore, the Milky Way, perhaps seen as representing a celestial river Nile, is east of the constellation of Orion, as the Nile itself is

> to the east of the Pyramids. When Orion is on the meridian, the observer who takes a position north of the pyramids and faces south will see the Belt of Orion directly in front of him in the sky, with the adjacent part of the Milky Way some distance to the Belt's left. The same observer will also see the pyramids in front of him on the ground in a similar configuration, and the Nile to the left. . . . The layout of the pyramids (whether by coincidence or design), may be said to imitate the pattern of the Belt stars. (Brück 2000)

Similar statements were given by other eminent British astronomers and physicists, among them Percy Seymour, Ph.D., professor of astronomy at Plymouth University; Chandra Wickramasinghe, professor of applied mathematics and astronomy at Cardiff University; Archie Roy, professor emeritus of astronomy at the University of Glasgow; David MacKay, Regius Professor of engineering at the University of Cambridge; and Chris Doran of the Cavendish Laboratory at the University of Cambridge.

It should be obvious that Krupp's peculiar manner of seeing the OCT was not accepted by astronomers, some of whom, it should be pointed out, were far more senior than himself. However, and notwithstanding the possible ulterior motives that might have spurred Krupp (viz., his associations with the Committee for the Scientific Investigation of Claims of the Paranormal [CSICOP] and the Council for Media Integrity [CMI]; see appendix 1) to attempt this debunking against the OCT, let us try to understand the *technical* reason behind Krupp's accusation.

IS NORTH "UP" OR "DOWN"?

The question of why north is at the top of modern maps is often raised. From a purely scientific viewpoint, since the Earth is a globe in space, then any direction can be considered "up" or, for that matter, also "down." From an observer's viewpoint "up" is directly above his or her head, technically called the *zenith*. So the reason, and only reason, why today north is placed at the top of a map is because of a *convention* and not a geographical or astronomical reality. This convention could as easily have had south, east, or west as "up." Bearing this in mind, let us now see what Krupp really meant by "turning Egypt upside down."

Imagine being an observer at Giza looking south. In this position north is, of course, directly behind you. Now imagine looking at Orion's Belt when it was in the south in 10,500 BCE. You would see Orion's Belt very low on the southern horizon, almost "touching" the Earth. Now focus your attention on the topmost star of Orion's Belt, Mintaka. It is still south, right? Well, not according to Krupp. The reason, Krupp says, is that if you extend a line upward from the star and loop it over your head and then down again on the northern horizon behind you, then you must say that the top part of Orion's belt is facing north. This, of course, would only be true if the sky was a sphere over the Earth, which, of course, it is not. But wait, it could still be argued that it would be true if you would *visualize* the sky as a sphere. The problem here is that we have no evidence that the ancient Egyptians visualized the sky as a sphere. Indeed, Krupp himself affirmed that the Egyptians *did not visualize the sky as a sphere!* In Krupp's own words, "There is . . . no evidence from antiquity to verify that such detailed conventions of spherical geometry and their imposition on the sky are any older than perhaps the fourth or fifth century B.C., when they appear in Greece. While it is possible these notions were extant in the Mediterranean in a slightly earlier era, *what we know of Egyptian cosmology suggests the sky was not visualized as a sphere*" (Bauval 2002; italics added).

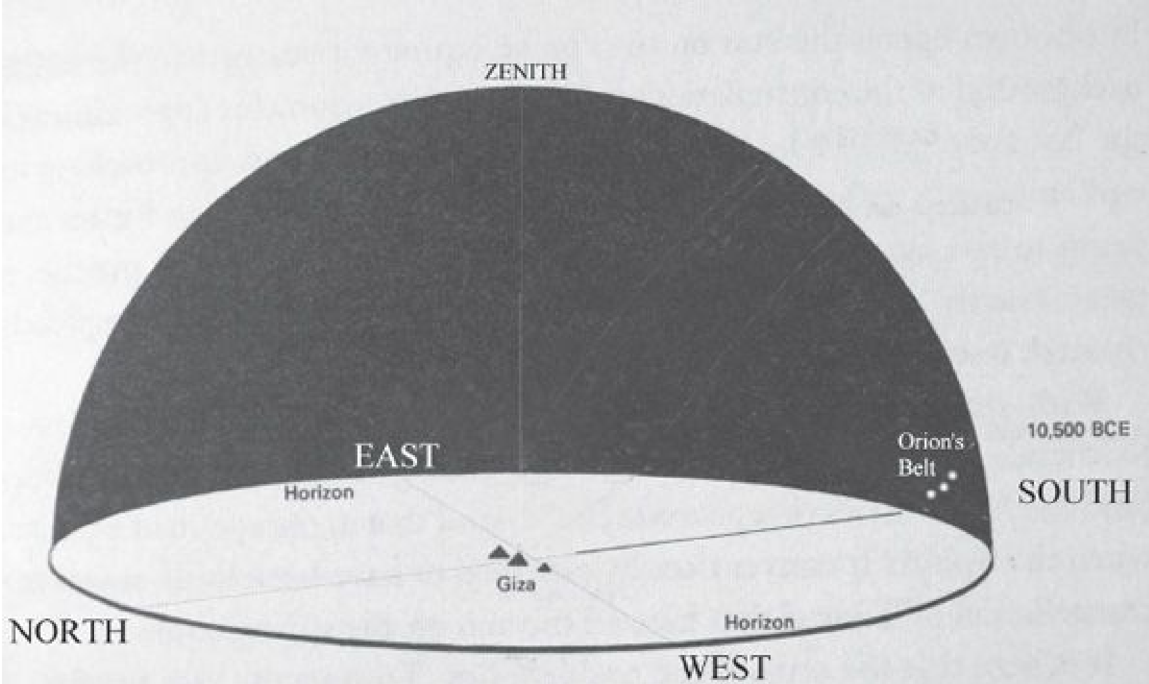


Fig. A2.2. Orion's Belt low in the southern sky in 10,500 BCE.(Image courtesy of R. Bauval.)

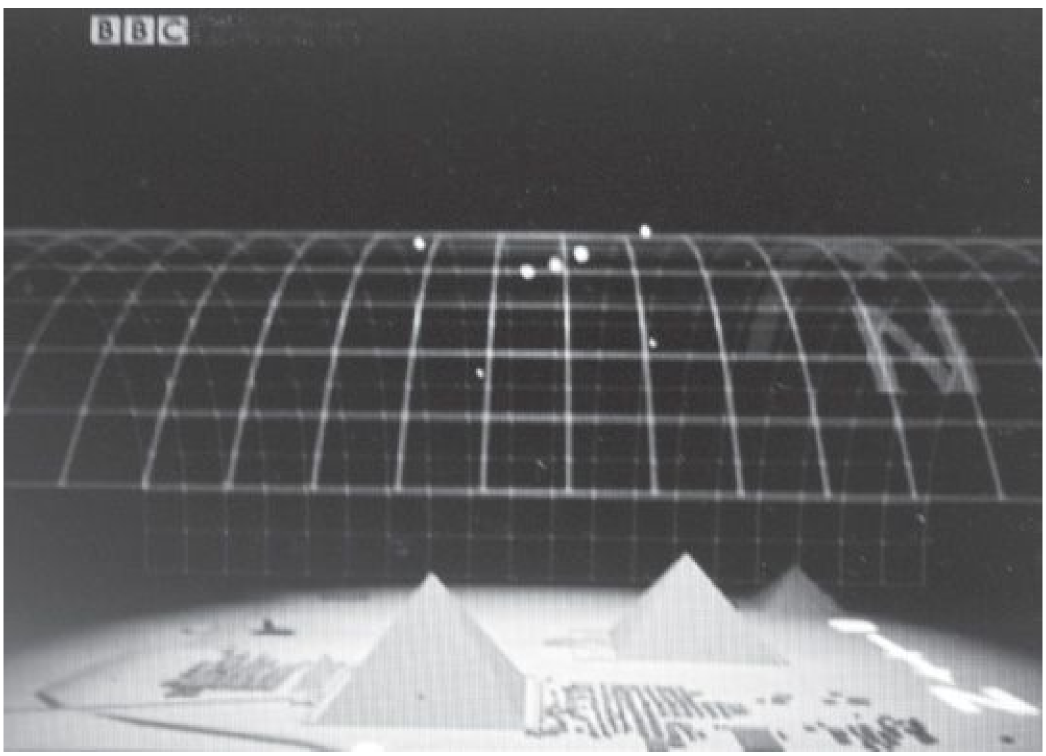


Fig. A2.3. Krupp's "you have to turn Egypt upside down" idea as shown on the BBC's Horizon *episode* Atlantis Reborn Again. *According to Krupp, the sky must be "folded down" over the pyramids to make a sky/ground correlation.*

The fallacy of Krupp's reasoning (assuming it wasn't just CSICOP-style debunking) was pointed out by various astronomers and physicists, including Seymour, who said, "Dr. Krupp has fallen into the trap that many modern astronomers encounter when they try to fit ancient concepts and beliefs concerning the cosmos, into the procrustean bed of modern science. He has overlooked the fact that to the ancient Egyptians the earth was not a sphere surrounded by another—the celestial sphere" (Percy Seymour's rebuttal supplied for the BBC *Horizon,* November 24, 2000).

In other words, Seymour was reminding Krupp that the Egyptians did not base themselves on modern mapping convention or use spherical geometry projections. Still, let me try at least to explain what Krupp had in mind (other than obviously debunking the OCT). According to Krupp, in order to have the stars of Orion's Belt match the Giza Pyramids you would first have to perceive the sky as a sphere covering the Earth, then flip down the sky onto the ground, and then imagine yourself *behind those stars* and looking down onto the ground.

A recent diagram made by Joseph Bieniasz of the Griffith Observatory for Krupp's entry in the *Handbook of Archaeoastronomy and Ethnoastronomy* clearly shows a spherical sky being flipped over a spherical earth, with the perspective of looking down from *behind* the stars (Ruggles 2015, 275).

But Krupp, as to be expected, won't give up so easily and gives an explanation to this: "Bauval may claim that my complaint about his use of spherical astronomy is contradicted by my earlier arguments about the inversion of Giza with respect to the sky. This is not so. All of the earlier arguments about cardinal directions and the local meridian remain in force. The sky does not have to be spherical to uphold the validity of my challenge on inverted directionality."

What does Krupp mean exactly by "inverted directionality"? Well, according to Krupp we must take into account the shafts emanating from the King's Chamber and the Queen's Chamber of the Great Pyramid. His reasoning (again fallacious) is that the northern shafts point north and the southern shafts point south; this, he says, confirms that the ancient Egyptians knew where north was and where south was. So according to Krupp, for the OCT to work, one has to "turn Egypt upside down." But then Krupp admits, "If [Bauval] had not endorsed the astronomical meaning of the airshafts, which locks the pyramid's sides to particular directions, my [upside-down] complaint would not hold . . . [his] argument is contradictory and flawed in other details through arbitrary data selection" (Krupp to Ivan Verheyden, editor of *Revue Kadath*, October 11, 1997).

First let us be clear on one point: no one, as far as I know, is endorsing the "astronomical meaning of the shafts," least of all me. Indeed, I have often pointed out that the shafts did not have an astronomical function at all because, quite simply, they emanate from the chambers *in a horizontal direction for a few meters then turn upward*, making them useless for astronomical observations. The purpose of these shafts was purely *symbolic*, with the metaphysical "function" to direct the soul of the departed king to his afterlife destinations in the sky. This symbolic function was first proposed in 1964 by astronomer Virginia Trimble and Egyptologist Alexander Badawy (Trimble 1964, 183–87), and it is widely accepted by Egyptologists and astronomers, including Krupp himself, who, in 1983, wrote, "These celestial alignments [of the shafts] don't make an observatory out of the Great Pyramid, for neither Thuban nor Orion could actually be seen through the shafts' openings inside the King's Chamber. Both shafts bend horizontally for a short distance before they reach the King's Chamber and also at their other ends prior to opening on the north and south face of the pyramid. The shafts are *symbolic* references to the pharaoh's celestial destinies" (Krupp 1994, 105).

In 1990 I proposed a similar symbolic meaning for the shafts of the Queen's Chamber, offering that the southern shaft was directed at Sirius in Canis Major and the northern shaft at Kochab in Ursa Minor (Bauval 1990, 21–25). Having said this, I cannot see how this makes my OCT "contradictory and flawed in other details through arbitrary data selection," as claimed by Krupp. As an aside, let us note that even one of Krupp's most ardent supporters, the astronomer Anthony Fairall, Ph.D., of the University of Cape Town and director of the Cape Town Planetarium (who also offered his services to the BBC to debunk the OCT), was compelled to admit that "the North-South reversal argument detracts from the key criticism, and Ed Krupp seems to push it too far" (Anthony Fairall, private correspondence with Ian Lawton, February 18, 2000). Fairall went on to explain, "The counter argument [to Krupp's view] is, however, well known in astronomy. Directions are flipped when a plan laid on a table is instead held above one's head or vice-versa. If one looked *south* from Egypt and viewed Orion above the Southern horizon (when it is at its highest) and then swung down the view about an east-west line, it would match the sense of the pyramid layout" (italics added).

An archaeoastronomer from Finland, Christopher Tedder, explained it better when he wrote:

> In the context of representing the "belt" stars on the ground, the idea that "up" is north is inconsistent with the compass directions for east and west. If "up" is north, and "down" is south, then right is to the east and west is to the left, according to modern compass convention. However, when looking at the "belt" due south, to the right is west not east. East and west are reversed if "up" is north. It is far more natural to describe the scene as particular stars being simply above or below other stars. [Miroslav] Verner mentions that south was the important direction for the ancient Egyptians. (The AE [ancient Egyptians] seemed to equate west with right and east with left, and this is only correct if looking south.) They would have represented the "belt" according to their design conventions, as it seemed most clear and natural. (Chris Tedder www.kolumbus.fi/lea.tedder/OKAD/sky2475.htm)

Here is yet another explanation, given by Dominique Gorlitz, Ph.D., an experimental archaeologist and specialist in ancient navigation and charts using naked-eye stellar course plotting:

> I have a PhD in experimental archaeology and I am a professional navigator. I am the founder of the ABORA Project which studies ancient seafaring cultures, their maps and methods of navigation in the open sea. When consulting a sky-map it is totally acceptable and natural to place the top of the map such that it faces the direction of observation to compare the constellations drawn on the map as they appear in the actual sky. Accordingly, I have carefully reviewed the criticism of Edwin Krupp regarding the Orion Correlation Theory (OCT) and find it totally unfounded and pedantic. (personal communication from Dominique Gorlitz, Ph.D., March 23, 2015)

Quotes from Egyptologists about the "South" in Ancient Egypt

"It is now time to consider the terms in which the Egyptian viewed the physical universe. . . . He took his orientation from the Nile River, the source of his life. He faced the South, from which the stream came. One of the terms for 'south' is also a term for 'face'; the usual word for 'north' is probably related to a word which means 'back of the head.' On his left was the east and on his right was the west. The word for 'east' and 'left' is the same, and the word for 'west' and 'right' is the same." (Frankfort and Wilson 1961, 51)

"South was the most important direction for ancient Egyptians." (Verner 2001, 184)

"If we look at the map . . . with south at the top as the Egyptians viewed their world . . ." (Lehner 1997, 82)

“Contrary to modern usage the Ancient Egyptians orientated themselves to face southwards. At their back lay the Mediterranean and the rest of the ancient world. The west was for them the right, and the east the left.” (Plumley 1975, 19)

“The Egyptians orientated themselves toward the south . . . for example, the Turin gold mine map and a representation of the world on a Dynasty 30 coffin in the Metropolitan Museum of Art in New York, show the south at the top and the north at the bottom.” (Schneider 2013, 43)

Fig. A2.4. Facing south and looking at Orion. East is on the left; west is on the right. (Photo courtesy of R. Bauval.)

Fig. A2.5. View of Orion’s Belt from “behind the star,” as proposed by Krupp. (Photo courtesy of R. Bauval.)

AN ANGLE OF CONTENTION

Now let us deal with another argument against the OCT, put by Krupp's counterpart in South Africa, the astronomer Anthony Fairall.[*52]

Any discussion of how the ancient Egyptians might have reproduced Orion's Belt on the Giza Plateau must be considered in the context of the epoch and the means available to the builders. Unless otherwise proven, we must take it that the ancient builders did not have high-precision optical instruments or star charts with coordinates to the nearest arc-second, or astronomy computer software, or planetariums with projectors, or knowledge of spherical geometry. We must assume that they had only the most basic and rudimentary instruments to perform this complex task and that all observations were made with the naked eye.

There are nine consecutive operations involved:

1. Establish a meridian on the ground.
2. Measure the angle the three belt stars make with the sky meridian.
3. Transfer this angle to the ground meridian.
4. Measure the relative distance of the three belt stars to each other.
5. Measure the angle offset of the smallest (less bright) star, Mintaka, from the line joining the other two stars.
6. Transfer all measurements on the ground.
7. Extend the measurements to the required scale in order to mark the center points for each pyramid.
8. Set out the square bases of each pyramid.
9. Begin the construction of the pyramids.

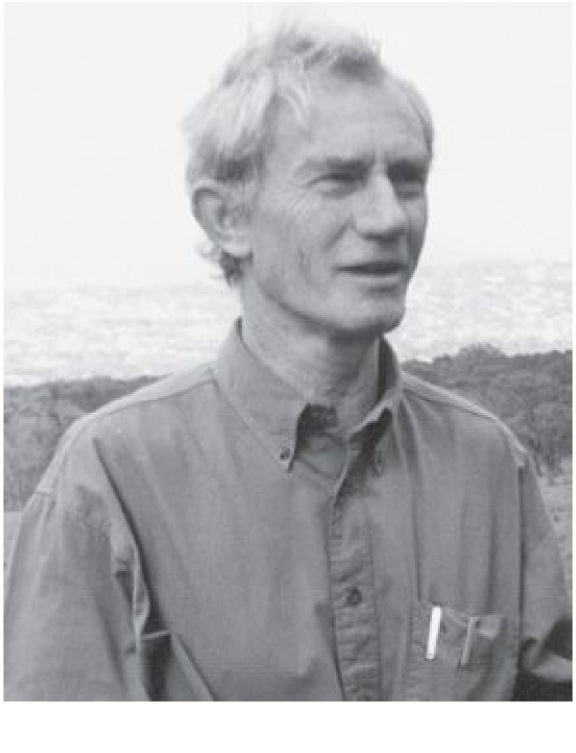


Fig. A2.6. Anthony Fairall, Ph.D., of the University of Cape Town and director of the Cape Town Planetarium. (Photo courtesy of R. Bauval.)

Operation 1: This entails setting out a north-south line on the ground. Several methods have been proposed by researchers for this purpose. Perhaps the most likely were using the shadow of the sun at noon or bisecting the rising and setting points of the sun on the same day; alternatively, using the rising and setting of a star (Isler 2001, 158–70). This north-south line (meridian or longitude) will eventually pass through the center of the Great Pyramid. This center point on the north-south line would then be fixed, possibly with a stone slab serving as a datum (datum 1).

Fig. A2.7. The apparent size of Orion's Belt as seen with the naked eye and "sized" with hand outstretched. (Photo courtesy of R. Bauval.)

Operation 2: This entails measuring the angle that Orion's Belt makes with the sky meridian. This is possibly the most tricky but crucial operation, because it must be carried out while Orion's Belt is "moving" clockwise at the rate of about 15º per hour. Also bearing in mind the relatively small "apparent size" of Orion's Belt, which is only 2°44´ in angular length—roughly thirty millimeters when measured with hand outstretched.

The way this operation was probably attempted was with a wooden rod to simulate the meridian, and attached to it a small sliding rule that could also rotate clockwise. The measurement, of course, will have to be done at night. It is difficult to see how this operation could be achieved with less than +/− 5º error in angular rotation.

Operation 3: This entails transferring the angle of Orion's Belt to the meridian on the ground. This could be achieved by placing the wooden rod over the north-south line and datum 1, then marking another datum

(datum 2). Here, too, it would be unrealistic to expect an accuracy of less than 2º in angular rotation.

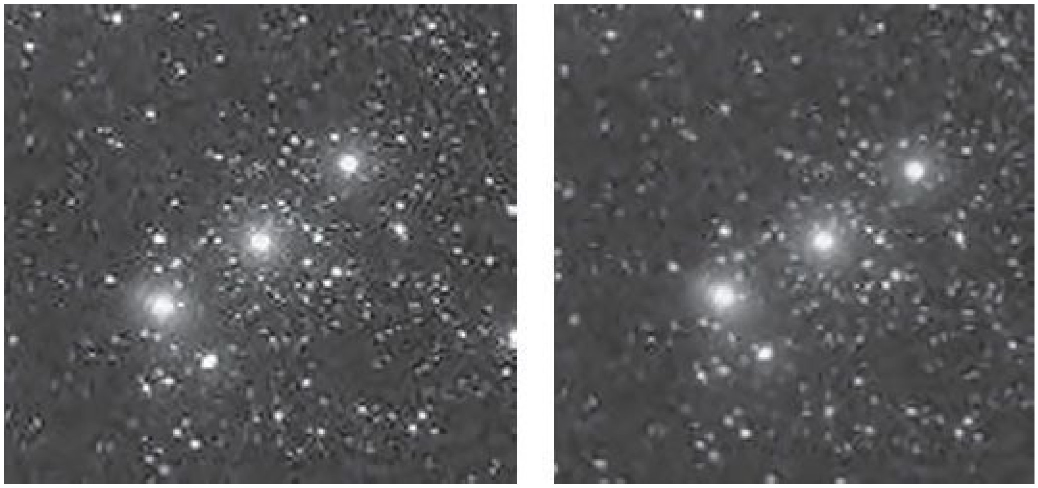


Fig. A2.8. Orion's Belt rotated 5º clockwise (left → right). This change takes place in about twenty minutes. (Photos courtesy of R. Bauval.)

Operation 4: This entails measuring the apparent distance of the three belt stars relative to each other. Using the naked eye only, it can be seen that the middle star, Alnilam, in Orion's Belt is equidistant to the other two stars. Trying to measure this with rudimentary instruments in the dark would not produce a better estimate.

Fig. A2.9. Orion's Belt: Alnitak, Alnilam, and Mintaka.(Image courtesy of R. Bauval.)

Operation 5: This entails measuring the angle offset between the top star, Mintaka, and the middle star, Alnilam, in Orion's Belt. It can be estimated with the naked eye that this offset is anything between 5º and 10º in angular rotation. Again, as in Operation 4, trying to measure this angle at night with rudimentary instruments will not produce a better estimate.

Operations 6 to 9: These operations entail setting out the three pyramids according to a "map." This "map" would either have been drawn on the ground in a small scale or drawn on a papyrus or similar flat surface. The setting-out operation would, again, be done with nonoptical sighting and measuring instruments. In such conditions, and taking into account the great distances involved (some 976 meters between the first and third pyramids), clearly a reasonable tolerance error must be assumed. Given the scale of 1:32,530, that is, converting the (apparent) 30 millimeters distance between the stars Alnitak and Mintaka of Orion's Belt to the 976,000 millimeters between the first and third pyramids of Giza, I would not expect an accuracy of less than 1º or 2º in angular projection.

Taking all nine operations into account, and the conditions under which they would be carried out, a minimum tolerance of 5º for angular positioning of the pyramids would be a reasonable value. It is one thing theorizing how all nine operations would work out on paper, but quite another thing to actually perform these operations. Fairall has *calculated* the angles using tables giving declinations and right ascension of the stars to the nearest arc-second that were obtained with high-precision optical instruments. As Wickramasinghe realistically pointed out, "Any slight mismatch of relative ratios or angles which there may have been is in my view less important than the overall similarity of disposition [of Orion's Belt and the Giza pyramids] which would have been unmistakable" (Chandra Wikramasinghe's, [in personal communication] response to the BBC *Horizon* program *Atlantis Reborn*, June 11, 2001).

My own view is that the ancient builders of Giza set out the three pyramids on the following criteria:

1. The relative distances between the three stars: from naked-eye observations it was accepted that the middle star, Alnilam, is equidistant from the other two stars.
2. The near-45º angle of Orion's Belt with the sky meridian was represented on the ground by the 45º line passing through the northeast and southwest diagonal of the Great Pyramid.
3. The offset of the third pyramid: this was estimated with the naked eye to be about 10º.

Ignoring for the moment the angle made with the meridian (2), when we compare the positioning of the three pyramids of Giza with those of the three stars of Orion's Belt using right ascensions and declinations obtained with high-precision optical instruments, the position of Mintaka is found to be near the west edge of the third pyramid. In consideration of the combined error tolerances for the nine operations, this is a reasonably good result.

Now, let us look at the correlation when the angle with the meridian is taken into account. First, let us see what exactly was said on the BBC *Horizon* documentary *Atlantis Reborn* on this issue:

> **Narrator:** "In June 1999 astronomer Anthony Fairall made another discovery. He re-examined the 45 degree angle that seemed to link the pyramid with the stars. Fairall found that the match is not as precise as originally claimed. The angle of the pyramids is 38 degrees, and that of the stars is 50 degrees."

The angle of 38º given by Fairall was not, of course, "discovered" by Fairall, as the BBC seemed to have implied, nor was it even measured by Fairall. It was culled (and rounded up) from the survey made by the British Egyptologist Sir Flinders Petrie in 1881, and which he published in 1883 in his book *The*

Pyramids and Temples of Gizeh, where it is stated, “The relative positions of the three larger Pyramids to one another were completely fixed in the triangulation, which included them all. The following are their distances apart, as measured on parallels inclined—5´ to true N, *i.e.*, at the mean azimuth of the First and Second Pyramids; and also the distances, and the angles from these parallels, of the direct lines from one Pyramid to another: *Center of First to center of Third Pyramid . . . 37º51´6˝*” (italics added) (Petrie 1883).

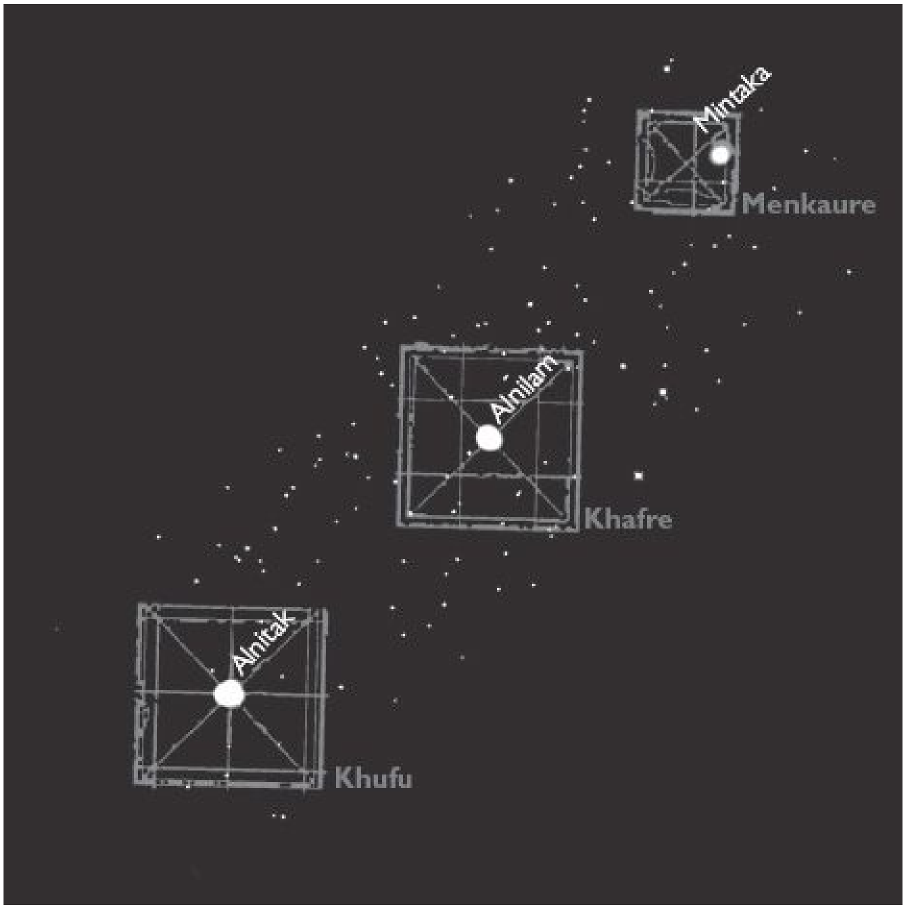


Fig. A2.10. The positioning of the three stars of Orion’s Belt over the pyramids on an equal-scale basis. (Images courtesy of R. Bauval.)

As for the angle of 50º given by Fairall for the belt stars, this was presumably *calculated* or measured off the planetarium screen. The BBC obtained the angles from Fairall’s article in the Royal Astronomical Society’s journal *Astronomy & Geophysics* of June 1999, in which he wrote, “My own investigation shows that while the line of the two outer pyramids is set at 38º from north, the angle of Orion’s Belt to north in 10,500 BCE is close on 50º! Hardly an exact match. I calculate that circular precessional motion would give 47º, whereas including nutational terms makes it slightly higher” (Fairall 1999).

An Exact Fit

In my book *The Egypt Code* I have shown that an “exact fit” for the OCT would have occurred at circa 11,450 BCE, using the “first time” of the star Sirius as seen from the latitude of Giza as well as the so-called sothic cycle (Bauval 2010, 64–65). But there will always be a level of uncertainty, not only due to the unknown effect of nutation and the precise effect of the proper motion of the stars, but also on the accuracy of the method used by the ancients and whether the measurements were made exactly at meridian passage. The reasonable position to take is that the same correlation holds true for the range of epochs circa 9500 BCE to 11,500 BCE, the average being 10,500 BCE, which falls exactly at the nadir of Orion's Belt and also when its position at the meridian coincides with the vernal equinox point on the east horizon, the winter solstice point at the south meridian, and the autumnal equinox point at the west horizon. The imagery in the sky in 10,500 BCE not only has a symbolic counterpart on the ground but also combines three major points of the solar year.

In private correspondence with the author Ian Lawton, Fairall, however, admitted, "My 50 degree angle is a rounded off value—I initially measured it from the planetarium projector. Subsequent calculations assuming circular precession put it closer to 48º, but there will always be some uncertainly due to the unknown effect of nutation. Planetarium and most computer programs assume circular precession which is a reasonable approximation. I would still like to look into proper motion, but I have assumed negligible" (Anthony Fairall, private correspondence with Ian Lawton, February 18, 2000).

The matter of this angle gets even more confusing when a year later the BBC rebroadcast the program on December 14, 2000, and changed somewhat the text to explain how this angle was measured (changes in italics).

> **Narrator:** ''In June 1999 astronomer Anthony Fairall made another discovery. He re-examined the 45 degree angle that seemed to link the pyramid with the stars as they were in 10,500 BCE. Fairall found that the match is not as precise as originally claimed. The angle formed by the two large pyramids is 45º; but the angle formed by the Belt stars is 54º."

As far as I know the angle of 54º is not mentioned in any of Fairall's publications or correspondence. Fairall did comment, "If one restricts the debate to only two pyramids, *then a fit is possible*. . . . [But] if only two stars and two pyramids are involved, *I felt the argument* [against Bauval] *was much weaker*" (Anthony Fairall, private correspondence with Ian Lawton, March 8, 2000; italics added).

But such a statement, of course, was not used by the BBC.

Through the years I have come to suspect that more than just the OCT itself, it was its widespread popularity with the general public that induced dislike for it with some academics. This can be sensed in Fairall's introduction to his article in *Astronomy & Geophysics*, using words that reveal such dislike: "Many members of the public have been captivated by recent books and video presentations concerning the pyramids and Sphinx of ancient Egypt. Books by Graham Hancock and Robert Bauval."

In contrast, the journal itself introduced Fairall's article with these words: "Anthony Fairall takes a hard look at some recent, well publicized claims about astronomical alignments of the pyramids" (Fairall 1999, 3.4). To my astonishment, Fairall's views on the OCT were later mentioned in his obituary, written by one of his colleagues, Patrick A. Woudt, Ph.D.

> In style with his character, Fairall rarely had a harsh word of criticism about the work of colleagues. A noticeable exception was when he entered a popular discussion regarding the astronomical significance of the alignment of the Egyptian pyramids, refuting some of the claims made by two authors, Graham Hancock and Robert Bauval. In correspondence with them, Fairall wrote: "It is the claim regarding the 10 500 BC date that I dispute on astronomical grounds. While I cannot say I approve of the manner in which this material has

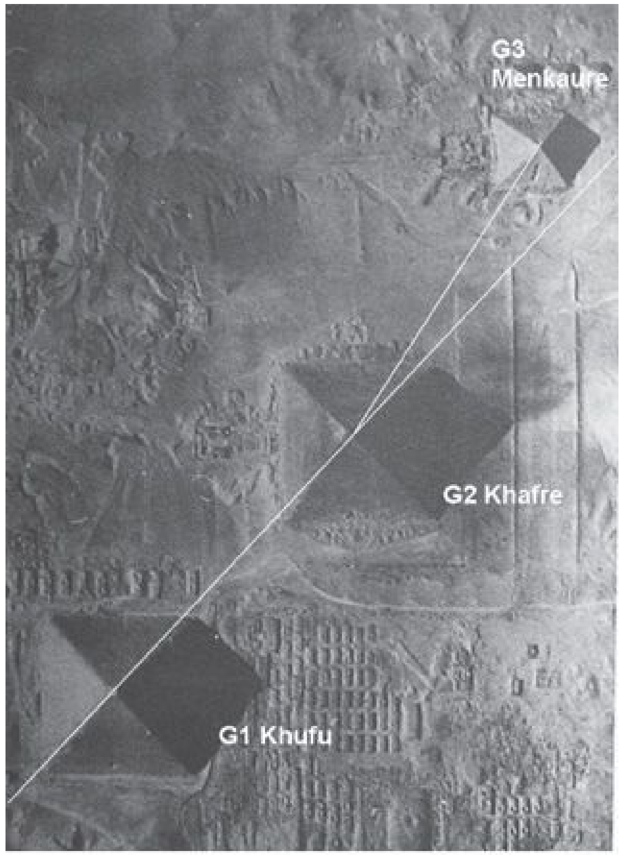
been conveyed to a public audience, I do recognize that it has brought about considerable interest in both pyramids and stars." (Woudt 2009)

Fairall's correspondence alluded to by Woudt was not with Hancock or myself, but with one of his friends in Cape Town (see Fairall 2016).

The truth is that no one, not even Krupp or Fairall, knows how, and with what degree of accuracy, the ancient Egyptians would have reproduced Orion's Belt on the ground into a vast monumental architectural plan. Mary Brück summed it up in the best way possible. I close this discussion by quoting her again. "The layout of the three pyramids, just speaking as an astronomer, is very reminiscent of the pattern of the three stars as in the Belt of Orion. There's no question about it . . . it's certainly . . . it's a very intriguing idea, there's no question about it. But I think we would have to go back in the minds of the ancient Egyptians to know whether in fact that's what they intended to do" (BBC2 1994).

POSTSCRIPT

The correct way to evaluate the OCT is by using scientific methods involving (1) a rigorous quantitative analysis, and (2) an approved statistical analysis.



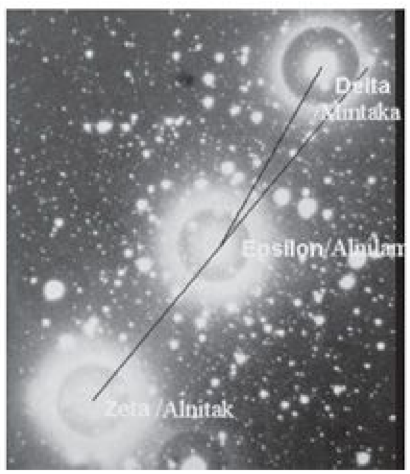


Fig. A2.11. The three pyramids of Giza (top); the three stars of Orion's Belt (bottom). (Images courtesy of R. Bauval.)

THE QUANTITATIVE ASTRONOMICAL ANALYSIS OF THE OCT

Vincenzo Orofino, an associate professor of astronomy and astrophysics at the University of Salento, has examined the OCT and has written a paper titled "A Quantitative Astronomical Analysis of the Orion Correlation Theory," with this summary: "In the present paper the OCT has been subjected to some quantitative astronomical and astrophysical verification in order to assess its compatibility with the results of both naked-eye astrometry and photometry. In particular, a linear correlation is found between the height of such monuments and the present brightness of the Orion Belt stars. According to these analyses it is possible to conclude that the OCT is not incompatible with what is expected for the stars of the Orion Belt on the basis of naked-eye astrometry and photometry, as well as of the stellar evolution theory" (Orofino 2016).

THE STATISTICAL ANALYSIS OF THE OCT

A second paper was also presented by Orofino, in collaboration with Paolo Bernardini, Ph.D., also from the University of Salento. This paper included a statistical analysis of the OCT carried out with the Monte Carlo method. This paper was published in *Archaeological Discovery*, a peer-reviewed publication online. Their conclusion was that the OCT could not be falsified. This rigorous analysis, I very much now hope, will encourage some Egyptologists to look at the OCT without the usual bias and arbitrary criticism (Orofino and Bernardini 2016, 1–10).

APPENDIX 3

The Ancient Egyptians and the Zodiacal Constellation of Leo

Robert Bauval

The Ramesside star clocks identify a constellation called the lion that matches the RA [right ascension] of Leo . . . there is reason to believe that the Senmut display lion, the Ramesside star clock lion, and the constellation Leo are essentially the same.

DONALD V. ETZ

According to my conclusions . . . it was Egyptians who started to use the second Zodiacal quartet: Taurus, Leo, Scorpio and Aquarius.

ALEXANDER GURSHTEIN, PH.D.

THE ZODIAC IN EGYPT

It has long been believed (and still is!) by Egyptologists that the ancient Egyptians did not know the zodiac and that it—the so-called Greco-Babylonian zodiac—was brought into Egypt sometime in the third or fourth century BCE, probably by the Greeks. This may indeed be so for the Babylonian zodiac, but it does not necessarily follow that the ancient Egyptians did not have a zodiac of their own or did not identify certain constellations along the zodiacal belt that were important to them. I very much believe they did have a four-constellation zodiac, and I will endeavor to show this here.

In the course of one year the sun appears to travel along a set path against a background of fixed stars. Astronomers call this path the ecliptic. There are clusters (constellations) of stars along this path that are very reminiscent of certain animals or objects that were familiar and common to most ancient cultures. These clusters are known as the *zodiacal* constellations, which is a derivative from the Greek word *zōidiakos*, meaning “circle of animals.” One of these zodiacal constellations is Leo, the lion. The writer Nancy Hathaway noted in her *Friendly Guide to the Universe*, “Leo resembles the lion after which it is named" (Hathaway 1964). Indeed, this constellation inspired many ancient cultures to identify it as a crouching or striding feline, usually a lion (Allen 1963, 252–63). In Egypt it was depicted as a lion on a sky-boat in the two zodiacs of Dendera and also in other zodiacs painted on the lids of sarcophagi, all dating from the Greco-Roman period. Egyptologists and astronomers agree that this lion is Leo, but are adamant that the ancient Egyptians did not know Leo *before* the Greco-Roman period, and thus any lions shown on astronomical drawings before the Greco-Roman period are deemed *not* to be the constellation we call Leo. The most outspoken on this matter is Edwin Krupp, director of the Griffith Observatory in Los Angeles. According to Krupp, "Despite some wishful thinking, the Egyptian lion constellation was *probably* not Leo" (Krupp 2001b, 86–88; italics added).

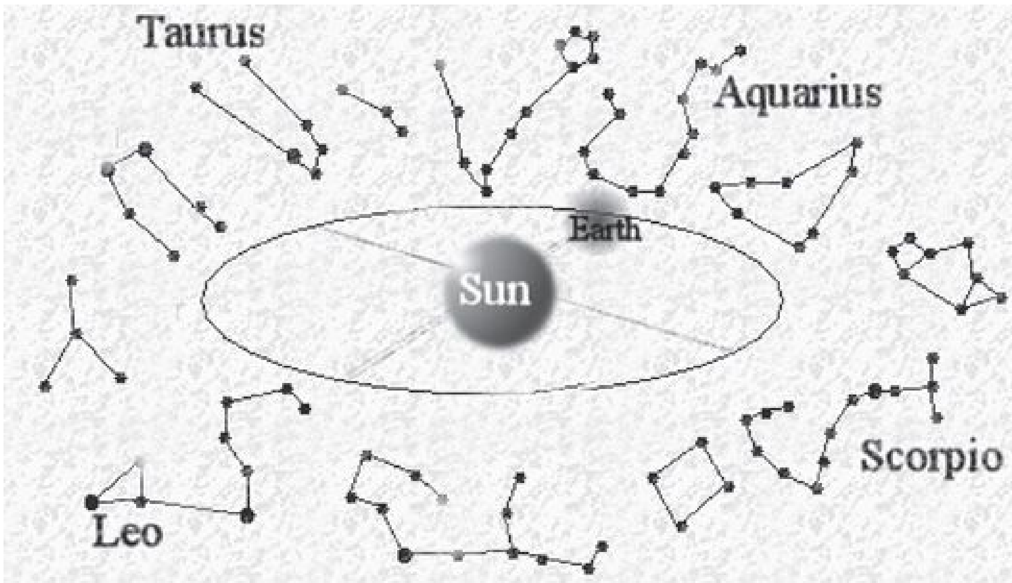


Fig. A3.1. The classical zodiacal belt with its twelve constellations, here showing the sun "in Leo." As the Earth moves counterclockwise through the year, other zodiacal constellations will appear to "house" the sun.

Krupp's view on this issue was, however, hotly opposed by Russian astronomer Alexander Gurshtein, one-time president of the International Astronomy Union Commission on the History of Astronomy. According to Gurshtein, not only did the ancient Egyptians know the zodiacal constellation of Leo long before the Babylonians, Greeks, and Romans, but also the Great Sphinx was a symbolic image of Leo and Aquarius: "According to my conclusion the Great Sphinx is a symbolical image for two constellations: Leo (summer) and Aquarius (winter)" (Gurshtein 1999).

Also, more recently, a Spanish astronomer specializing in ancient Egyptian astronomy, Juan Belmonte, Ph.D., of the Teide Observatory on the island of Tenerife, as well as his colleague Jose Lull, an Egyptologist, have jointly published their views that Leo was known in the New Kingdom, thus some one thousand years before the Greco-Roman period in Egypt. Referring to the "divine lions" called *m3i* and *ntr rwti* in the Ramesside star chart and the Senmut ceiling, respectively, both of the New Kingdom and dated circa 1450 BCE–1100 BCE, Belmonte and Lull wrote, "We accept the premise that *ntr rwti* and *m3i* are exactly the same constellation (both *rw* and *m3i* mean "lion" in ancient Egyptian, the former having a certain sacred character). As a corollary, we support the idea that the lion can be identified to Leo" (Belmonte and Lull 2009, 166; Belmonte 2001, 57–66).

Previously, as early as 1985, the Egyptologist Virginia Davis of Yale University had also identified the constellation of Leo in ancient Egyptian texts that predate the Greco-Roman period (Trimble 1985, S103). Davis was followed by Donald Etz, Ph.D., in 1997 (Etz 1997), and more recently, in 2003, the Egyptologist Richard Wilkinson of the University of Arizona wrote, “The stellar constellation now known as Leo was also recognized by the Egyptians as being in the form of a recumbent lion . . . the constellation was directly associated to the sun-god” (Wilkinson 2003, 206).

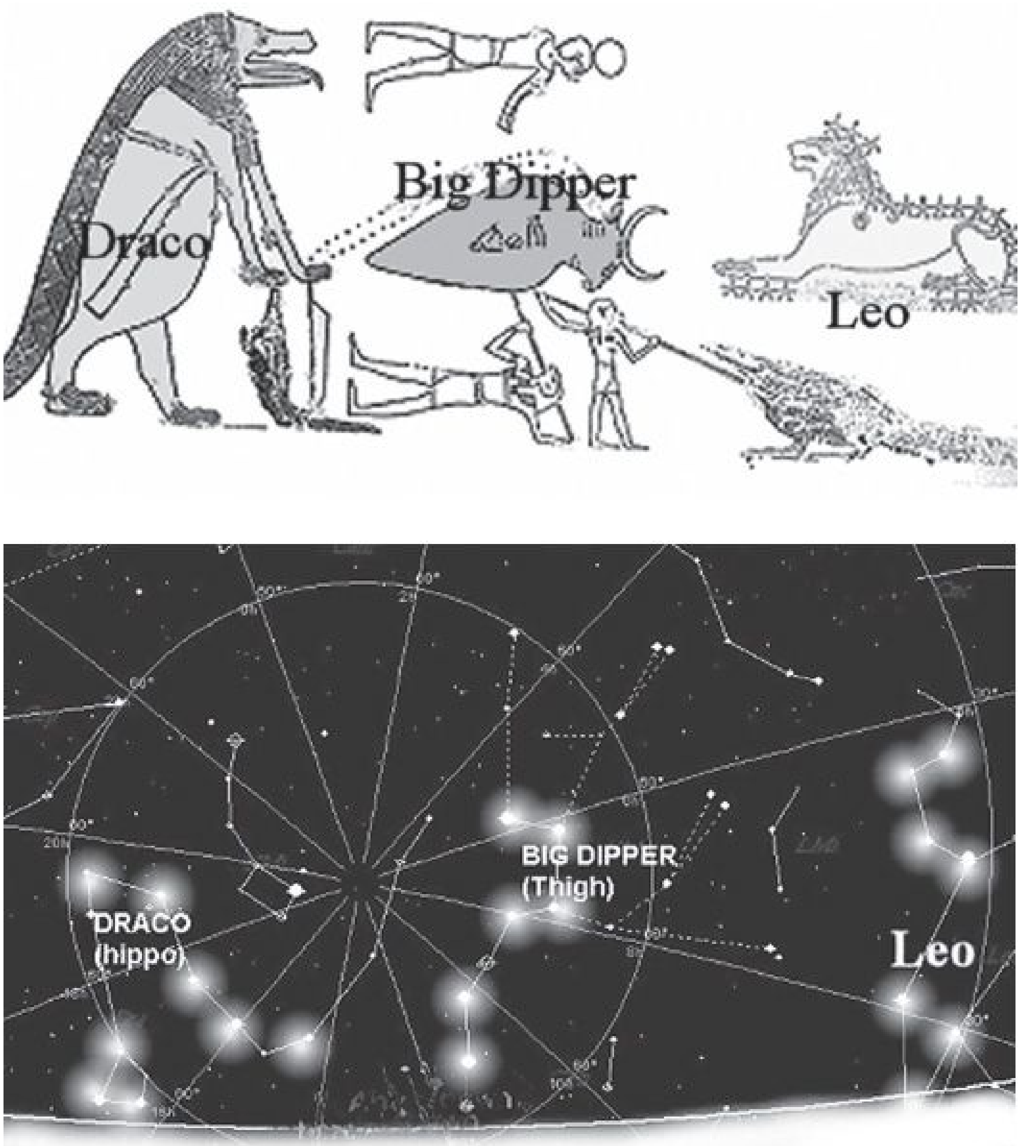


Fig. A3.2. The northern sky in ancient Egypt.

When Graham Hancock and I published *Keeper of Genesis* (*Message of the Sphinx* in the United States) in 1996, we also presented textual and astronomical evidence that not only did the ancient Egyptians recognize the constellation that we today call Leo as a recumbent lion, but also they related it to the Great Sphinx of Giza. But, as to be expected, Krupp rushed to the attack again to debunk this theory. His attack came with the usual patronizing tone toward “amateurs” in an article he titled “The Sphinx Blinks,” which appeared in the popular journal *Sky & Telescope* (Krupp 2001b, 86–88). Krupp’s main objections were:

1. [Ancient Egyptians] did not recognize the zodiac that is so familiar to us today. The zodiac is really a gift from the Greeks primarily rooted in Mesopotamian star lore.
2. The Sphinx represents *Horemakhet* and is the divine personification of the rising disk of the Sun, and

its intentional alignment toward cardinal east reflects the ritual significance of the cardinal directions in the Old Kingdom period.

3. Leo is on the other side of the celestial Nile, east of the Milky Way, and it faces Orion. On the ground, however, the Sphinx, the terrestrial reflection of Leo, is west of the Nile and on the same side of the river as the pyramids that allegedly symbolize the Belt of Orion. It also faces away from Orion. The Sphinx is on the wrong side of the river and facing the wrong way to match the sky (Krupp 2001b).

I will deal only with item 3 of Krupp's objections, since items 1 and 2 have already been discussed at length elsewhere in this book. Krupp, quite simply, is unable to grasp the dualistic form of ancient Egyptian thinking, where sky above and ground below were constantly thought of together (i.e., as above, so below). The celestial lion, Leo, faces the celestial river, the Milky Way, as does the terrestrial lion, the Great Sphinx, which faces the earthly river, the Nile—as, indeed, depicted on the Dream Stela of Tuthmoses IV: one lion (terrestrial) faces east and the other (celestial) faces west. This may appear "contradictory" to Krupp and others who think like him, but it is entirely consistent with ancient Egyptian dualistic thinking.

There is, however, another argument brought by Krupp that merits careful review, mostly because it also reveals the intractable attitude of the good doctor, even when confronted with irrefutable evidence that he is wrong. This concerns a curious statement he made in the same article of *Sky & Telescope*. I had pointed out to Krupp that the "lion" depicted on many of the astronomical ceilings of New Kingdom tombs was almost certainly Leo, as indeed suggested by many astronomers as well (e.g., Belmonte and others). Krupp totally rejected this outright and supplied a photograph with his article with a caption that explains his objections.

Fig. A3.3. High-definition photograph of the small creature that Krupp says is a "small lion" seated on the bull's knee or thigh.
(Photo courtesy of R. Bauval.)

Figure A3.3 shows an enlarged, high-definition photograph taken of the original Dendera Zodiac at the Louvre Museum in Paris.[*53] Krupp's alleged "small lion" can clearly be seen.

As can be clearly seen, the small creature that Krupp insisted is a “small lion” has its forelegs folded in. Such a posture is *anatomically impossible* for a lion or any other feline. Only *bovines and other hooved* creatures, such as cows, sheep, goats, horses, and such can fold their forelegs in this manner. Indeed, on the Dendera Zodiac is another animal with a similar posture. Such animals with forelegs folded are common, in fact, quite common, on Egyptian zodiacs and other religious iconography.

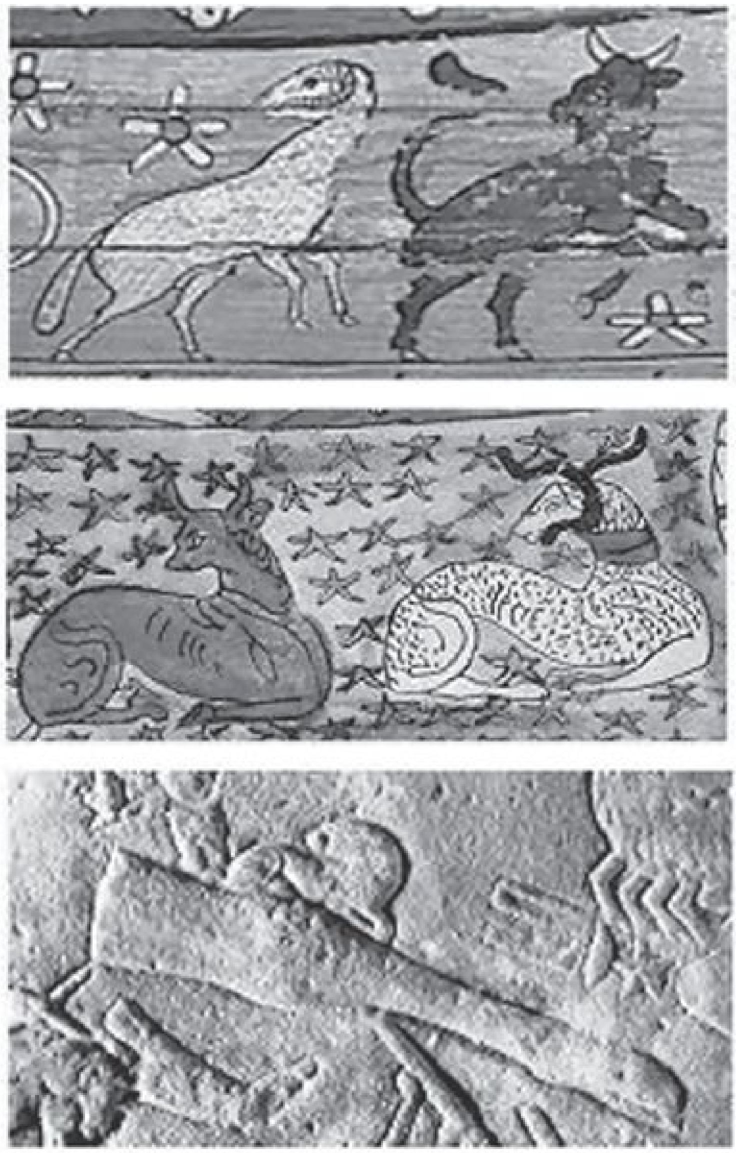


Fig. A3.4. Hooved creatures looking back on the Soter Coffin (top) and looking back with bent forelegs on the Petamenophis Coffin (center). These are clearly the same as the small creature on the Dendera Zodiac (bottom).

Fig. A3.5. Hooved creatures: (1) in the zodiac of the coffin of Heter, (2) in the Osiris Chapel Denderah, and (3) in the Zodiac of Athribis.

There is absolutely no doubt that the small creature is a hooved animal, probably a ram, and that Krupp made a blunder by calling it a "lion." However, when this was pointed out to him, instead of gracefully admitting his error, he went on to produce a long-winded argument on the Internet, trying desperately to convince his supporters that the small creature could *still be a lion*. He quoted other authorities who thought it *might* be a lion, then tried tongue-in-cheek statements such as "unwilling to let the lion lie down with the lamb" or "in like a lion, out like a lamb." When all his huffing and puffing failed to convince even his most enthusiastic supporters, Krupp suggested that "in the most familiar crouched posture of lions and other felines the forelegs are extended forward, and so that the bent forelegs on the small Crouching Lion *is the only element* of the figure that introduces any doubt in the animal's identity" (Krupp, in the HALLOFMAAT discussion board, September 29, 2002).[*54] Which is like saying that a small creature, say, that looks like a bird, flies like a bird, perches like a bird, and has feathers like a bird cannot be considered to be a bird because these are *the only elements* that identify it as a bird! At any rate, finally as a last shot, Krupp then proposed that the sculptor who created the Dendera Zodiac was unable to represent the small creature properly because of its small size. "If this creature be a lion, we might explain this single discrepancy [the bent foreleg] in its image as a product of the very small scale in which the artist was working. It is, in fact, remarkable that the artist was able to include as much realistic detail as was seen" (Krupp, in the HALLOFMAAT discussion board, September 29, 2002).

This argument, again, is flawed since there are many other small creatures and human figures on the Dendera Zodiac depicted in very realistic details! Frankly, it was getting clear, to me at least, that Krupp expected people to believe what he was saying rather than what their own eyes were showing them.

I rest my case.

THE LION IN SUMMER

There can be no doubt that the lion was a very important symbol in ancient Egyptian iconography. There is no need for me to list the plethora of lion statues and lion-bodied sphinxes, engravings, and drawings to make this obvious point. And this is not surprising, since in predynastic and even during dynastic times the adjacent deserts to the Nile Valley were inhabited by, and probably even infested with, lions. We can only but imagine how dangerous it must have been to wander in the desert before the invention of rudimentary weaponry such as the spear or the bow and arrow. And even when these weapons were available, the lion nonetheless remained a very dangerous creature to confront in the wild. We can also imagine the inhabitants of the Nile Valley being in constant vigilance of lions marauding down to the Nile to drink, especially in the hot summer during the Inundation season, when the overflow from the river reached the desert's edge. The appearance of packs of thirsty lions in this season at dawn on the water's edge, as well as the appearance of the constellation of Leo rising in the eastern horizon at that same time of year, almost certainly inspired the dualistically minded Egyptians of the dynastic era to regard both—lion and constellation—as symbols on the Inundation.

Fig. A3.6. A pride of lions drinking at the water's edge.
(Photo © Paul Renner.)

In chapter 6, however, we have shown how the Pyramid Texts, which date from the Old Kingdom, confirm that the constellation of Leo was observed rising at dawn during the summer solstice. This, in my opinion, was when the association of the Great Sphinx and the Inundation was made.

APPENDIX 4

The Sacred Mounds of the Memphite Region

Robert Bauval

We incline to the opinion that the sacred book, the Specification of the Sacred Mounds of the Early Primeval Age, records the successive phase of evolution of sacred places and temples in one single region which can reasonably be regarded as the homeland of the Egyptian temple.

EVE A. E. REYMOND

A PRIMORDIAL LANDSCAPE

The Memphite necropolis is a strip of sandy, rocky desert about sixty kilometers long on the western shore of the Nile running from the modern town of Abu Ruwash to the small town of Meydum. Here are to be found the major pyramid fields of the Old Kingdom: Abu Ruwash, Giza, Zawyet el Aryan, Abusir, Saqqara, Dashur, and Meydum. This was a most sacred region that was considered to be the afterlife abode for departed kings and royals. On the east side of the Nile, opposite the Memphite necropolis, was the land of the living, with the royal capital at Memphis (known as the White Wall) and the religious centers at Heliopolis (known as Innu) and Letopolis (known as Khem). This region, known to Egyptologists as the Memphite region, was probably originally a vast open-air temple some thirty square kilometers in size.

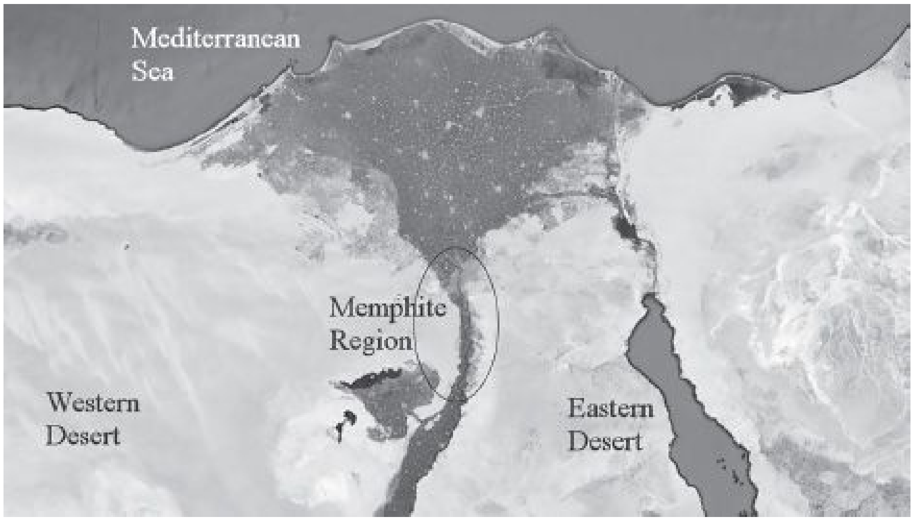


Fig. A4.1. The Memphite region in Lower (northern) Egypt. (Image courtesy of R. Bauval.)

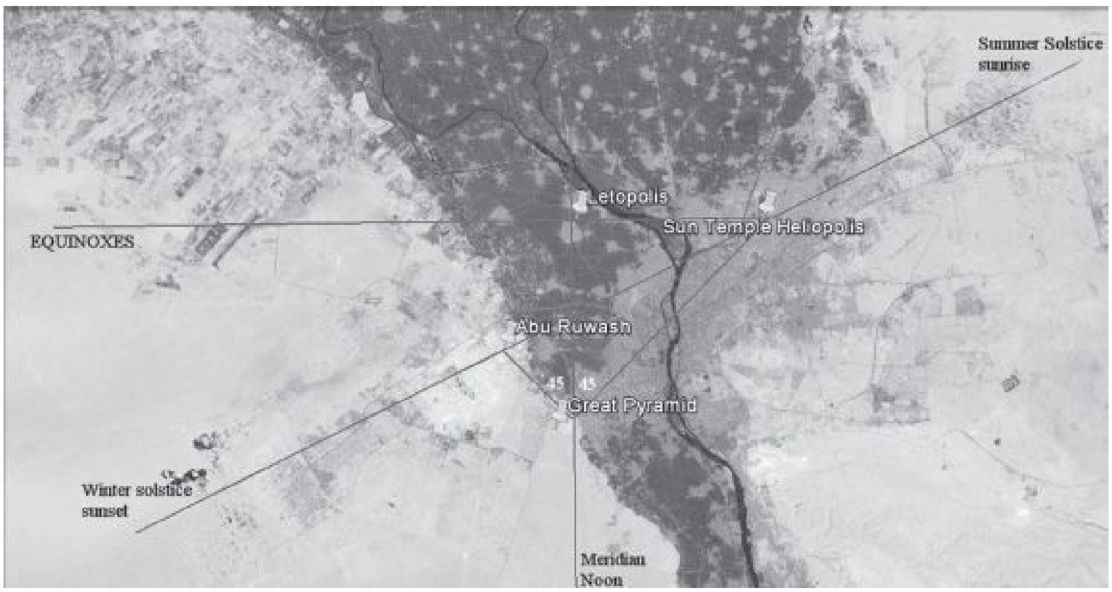


Fig. A4.2. The sacred mounds of the Memphite region. (Image courtesy of R. Bauval.)

Let us imagine this vast area undisturbed by human hands at the end of the last ice age, say at about 10,500 BCE. Essentially, the landscape was composed of the Nile Valley flanked by the eastern and western deserts. In the region, where modern Cairo is today, these two deserts formed high, elongated limestone ranges, the eastern one known today as the Mokattam Formation and the western one as the Libyan Plateau. Several mounds or promontories on both sides of the Nile Valley stood out, notably those of Heliopolis, Letopolis, Abu Ruwash, Giza, and Saqqara.

SOLAR ALIGNMENTS

In my books *The Egypt Code* (2006) and *Imhotep the African* (2013, with Thomas Brophy), I have shown that there is a deliberate geometrical interrelationship between five sacred mounds—Heliopolis, Letopolis, Abu Ruwash, Giza, and Saqqara—that also involves solar observations that cannot simply be attributed to coincidence.[*55]

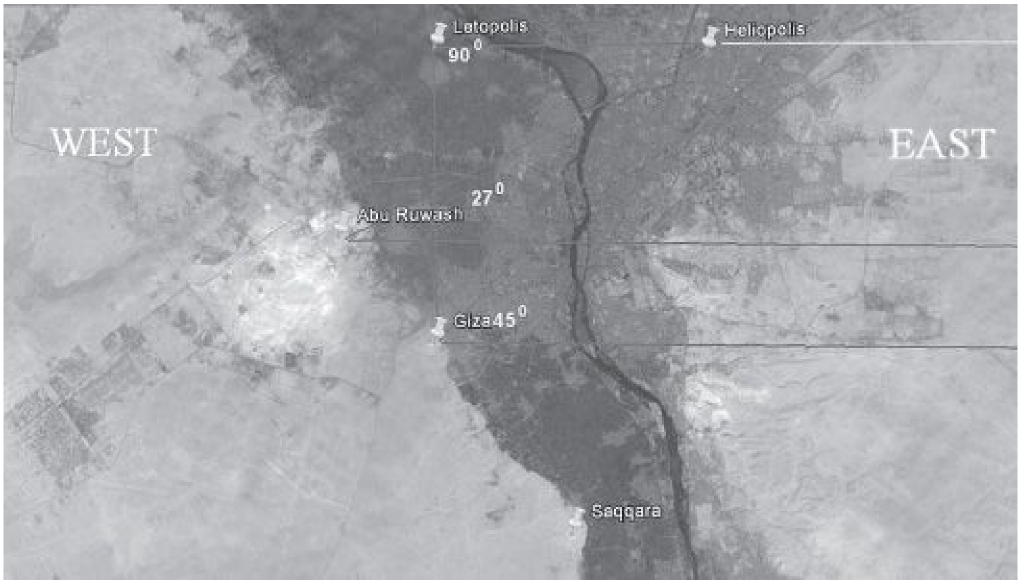


Fig. A4.3: Geometrical interrelationship between the sacred mounds. (Image courtesy of R. Bauval.)

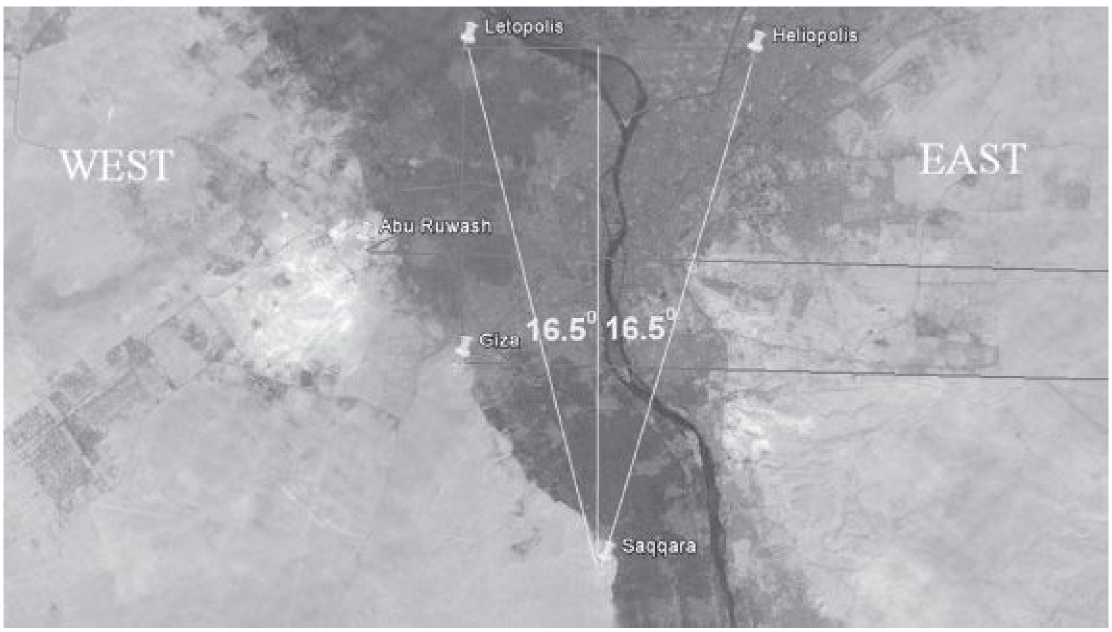


Fig. A4.4: Geometrical interrelationship between Saqqara, Heliopolis, and Letopolis. (Image courtesy of R. Bauval.)

From the various ancient texts we learn that the most sacred and ancient of all these mounds was that of Heliopolis. It was on this mound that "creation" and the "first sunrise" took place, according to the earliest Egyptian cosmology. In the Pyramid Texts we read:

> Atum is he who once came into being, who masturbated in Heliopolis. He took his phallus in his grasp that he might create orgasm by means of it. (Pyramid Text 1248)

> O Atum-khoprer [sunrise], you became high on the heights [pillar/ mound?], you rose as the Benben stone in the Mansion Of The Phoenix in Heliopolis. (Pyramid Text 1652)

Could the mound of Heliopolis have been a geodetic marker or datum from which astronomical observations and geographical measurements could be made? Anyone who has spent some time in open country where there are low hills and mounds will be tempted to use them to fix the positions of the rising and setting of celestial bodies, especially the sun. The undulated horizon, with peaks and nooks, and the sky vault above become, quite literally, a kind of open-air planetarium that can be used for calendrical computations and to establish geographical directions. With Heliopolis as the main point of observation, a person looking west would be able to see (1) the mound of Letopolis at azimuth 270º (due west), fixing the sunset point at the equinoxes; (2) the mound at Abu Ruwash at azimuth 243º (27º southwest), fixing the winter solstice sunset; and (3) the mound at Giza at azimuth 225º (45º southwest), creating a Pythagorean triangle with Letopolis.[*56]

At the foot of the Giza mound (on the Giza Plateau) was a prominent knoll that was to later become the "head" of the Great Sphinx (see chapter 1). Could this knoll also have had an interrelationship with Heliopolis? Since early dynastic times Heliopolis was known as *per-atum,* the "city" or "domain" of Atum. It may not be a coincidence, therefore, that a well-known epithet for the Great Sphinx was "Living Image of Atum." We have seen in chapter 3 that the Egyptians believed in the existence of a very ancient book dating from primeval times, in which was listed the location and "specification" of "sacred mounds" on which much later religious edifices—"temples"—were erected. Thus, according to Egyptologist Eve A. E. Reymond, "We incline to the opinion that the sacred book, the *Specification of the Sacred Mounds of the Early Primeval Age,* records the successive phase of evolution of sacred places and temples in one single region which can reasonably be regarded as *the homeland of the Egyptian temple*. Our study has furnished convincing evidence that this sacred book was based to a considerable extent, if not exclusively, on Memphite religious beliefs. It has every appearance of disclosing the history of sacred domains that were founded in the Memphite region during pre- and protodynastic times" (Reymond 1969, 267).

Could the Memphite region and its sacred mounds have been the place of "creation" for the ancient Egyptians, which they associated with the epoch of *zep tepi,* the "first time"?

APPENDIX 5

Text of the Dream Stela

Translation by J. H. Breasted, 1906

[From Breasted, J. H., translator and editor. 1906. Ancient Records of Egypt, Historical Documents. Vol. II, *The Eighteenth Dynasty*. Chicago: The University of Chicago Press, 321–24.]

Year I, third month of the first season, day 19, under the majesty of Horus: Mighty-Bull-Begetting-Radiance; Favorite of the Two Goddesses: Enduring-in-Kingship-like-Atum; Golden Horus: Mighty-of-Sword, Repelling-the-Nine-Bows; King of Upper and Lower Egypt; Menkheprure, Son of Re: [Thutmose IV, Shining] in Diadems; beloved of—, given life, stability, satisfaction, like Re, forever. Live the Good God, son of Atum, Protector of Harakhte, living image of the All-Lord; sovereign, begotten of Re; excellent heir of Khepri; beautiful of face like his father; who came forth [—] equipped with the form of Horus upon him; a king who—the gods; who—favor with the ennead of gods; who purifies Heliopolis, who satisfies Re; who beautifies Memphis; who presents truth to Atum, who offers it to Him-Who-is-South-of-His-Wall (Ptah); who makes a monument by daily offering to Horus; who does all things, seeking benefits for the gods of South and North; who builds their houses of limestone; who endows all their offerings; son of Atum, of his body, Thutmose (IV), Shining in Diadems, like Re; heir of Horus upon his throne, Menkheprure, given life.

When his majesty was a stripling like Horus, the youth in Khemmis, his beauty was like the protector of his father, he seemed like the god himself. The army rejoiced because of love for him, the king's-children and all the nobles. Then his strength overflowed him, and he repeated the circuit of his might like the son of Nut.

Behold, he did a thing that gave him pleasure upon the highlands of the Memphite nome, upon its southern and northern road, shooting at a target with copper bolts, hunting lions and wild goats, coursing in his chariot, his horses being swifter than the wind; together with two of his followers, while not a soul knew it.

Now, when his hour came on for giving rest to his followers, (it was always) at the [shoulder] of Harmakhis, beside Sokar in Rosta, Renutet—in heaven, Mut—of the northern—the mistress of the Wall of the South, Sekhmet presider over Khas [—] the splendid place of the beginning of time [*zep tepi;* note added by R. Bauval], over against the lords of Khereha, the sacred road of the gods to the necropolis west of On (Heliopolis). Now, the very great statue of Khepri, rests in this place; the great in prowess, the splendid in strength; upon which the shadow of Re tarries. The quarters of Memphis and all the cities which are by him come to him, (raising) their hands for him in praise to his face, bearing great oblations for his ka.

One of those days it came to pass that the king's-son, Thutmose, came, coursing at the time of midday, and he rested in the shadow of this great god. A [vision] of sleep seized him at the hour (when) the sun was in the zenith, and he found the majesty of this revered god speaking with his own mouth, as a father speaks with his son, saying: "Behold thou me! See thou me! my son Thutmose. I am thy father, Harmakhis-Khepri-Re-Atum, who will give to thee my kingdom on earth at the head of the living. Thou shalt wear the white crown and the red crown upon the throne of Keb, the hereditary prince. The land shall be thine in its length and breadth, that which the eye of the All-Lord shines upon. The food of the Two Lands shall be thine, the great tribute of all countries, the duration of a long period of years. My face is thine, my desire is toward thee. Thou shalt be to me a protector (for) my manner is as I were ailing in all my limbs [—]. The sand of this desert upon which I am, has reached me; turn to me, to have that done which I have desired, knowing that thou art my son, my protector; [come hither], behold, I am with thee, I am thy leader."

When he had finished this speech, this king's-son [awoke] hearing this—, he understood the words of this god, and he kept silent in his heart. He said: "Come, let us hasten to our house in the city; they shall protect the oblations for this god which we bring for him: oxen [—] and all young vegetables; and we shall give praise [to] Wennofer, —Khaf[re], the statue made for Atum-Harmakhis ——."

APPENDIX 6

Redating the Great Sphinx of Giza: The Original 1992 Paper

Robert M. Schoch

This appendix reprints the text of the initial formal paper that presented my redating of the Great Sphinx, as published in *KMT, A Modern Journal of Ancient Egypt* (vol. 3, no. 2, Summer 1992, 52–59, 66–70). It followed the presentation that John Anthony West and I gave at the Geological Society of America (GSA) annual meeting in San Diego in October 1991, as well as the debate over the age of the Sphinx sponsored by the American Association for the Advancement of Science (AAAS), which was held at their annual meeting in Chicago in February 1992. It preceded the initial television airing of *The Mystery of the Sphinx* (hosted by Charlton Heston) on NBC on November 10, 1993 (see chapter 7).

Although this paper was published in a well-known journal at the time, much of the debate over the age of the Great Sphinx was carried on by people (on both sides) who appeared to have not read it and who based their views only on accounts in the popular media. Since it is long out of print and not readily available to the general public or even many specialists, yet in my opinion has stood the test of time and is now of historical importance, it is reprinted in full here. By carefully perusing it and comparing it to appendix 7, the thoughtful reader will be able to follow the historical development of the "water erosion theory" of the Great Sphinx.

The original pagination for the article is pages 52–59 and 66–70; however, the text begins on page 53 as page 52 was a photograph of the head of the Great Sphinx supplied by the editor of *KMT*, Dennis C. Forbes. I wrote the article to stand alone, without photographs or other illustrations; in the original printed version the editor supplied various photographs, and he also used selected photographs and illustrations that I had sent him. Below is the original text of the article (with the correction of a few minor typographical errors that made their way into the published version) as published in 1992. Subsequent comments inserted by me (Robert Schoch) appear in brackets and italics.

An editorial introduction, by Forbes, accompanied my article. It began on page 53 of the original printed version and is reprinted here as originally published, including the headline in all caps and the actual comments, which were placed in parentheses. This editorial introduction was originally set in italics, which have been removed below for the sake of clarity. I wish to note that I did not expect any such editorial comments; they were a surprise to me when I received a published copy of the issue of the journal containing my article.

MAINSTREAM EGYPTOLOGISTS REACTED WITH TOTAL DISBELIEF WHEN IT WAS PROPOSED RECENTLY THAT THE FAMOUS PYRAMIDS SPHINX WAS MUCH OLDER THAN THE 4TH DYNASTY

(Earlier this year readers of the popular press in the U.S. were treated to stories that an American geologist, Professor Robert M. Schoch of Boston University, had recently reached the determination that the famous gigantic bedrock limestone sculpture guarding the Old Kingdom pyramids on the Giza Plateau, known popularly as the Great Sphinx, may be somewhat older than has always been thought—anywhere from 2,500 to 4,500 years older, in fact! Needless to say, this revelation sent a shock wave through the international community of professional Egyptologists, individuals therein being quick to totally reject Schoch's thesis when pressed for a reaction by the media. *[This is absolutely true. Within hours of the original presentation that West and I gave at the GSA meeting in 1991, Egyptologists who had been called, via phone back then, by reporters were stating that my conclusions were impossible. Of course, they had not seen our presentation, they had not perused my data or analyses, they had not discussed the issue with me, and most or all had never even heard of me before. Yet, they felt confident to judge and make statements to the press. The comment by Forbes concerning a "shock wave" was perhaps intended as a play on my name, Schoch.]*

Reading the newspaper reports carefully, it was possible to determine that Professor Schoch's field research on the Giza Plateau had been initiated by John Anthony West, a self-styled "rouge Egyptologist" (author of *Serpent in the Sky*, Harper & Row, 1979), whose personal agenda regarding the study of ancient Egypt is somewhat outside the "mainstream" of academic Egyptology. *[Among other crimes, West took the concept of Atlantis—at least in terms of a civilization that goes back to an earlier period, prior to dynastic Egypt—seriously.]* West's perceived association with Schoch, therefore, immediately prejudiced the latter's findings and made the whole purpose of his Sphinx investigations highly suspect in the view of academic Egyptologists generally. *[Yes, I have encountered much prejudice when it comes to my work on the Sphinx, yet much of the public still tends to believe that somehow "science" is supposed to be "objective" and free of prejudice. Of course, this is a myth, at least in terms of how science is pursued by real people in the world today. Furthermore, although they may occasionally apply scientific techniques, most Egyptologists are decidedly not scientists.]*

After reading a copy of Professor Schoch's original paper—the full account, not just the press's sensationalized distillations—the editor of this journal contacted the Boston geologist to see if *KMT* might publish this so that Journal readers (and professional Egyptologists, too) also might digest his controversial findings and make their own determinations as to the possibility that the Great Sphinx of Giza is somewhat more ancient than has ever before been suspected. *[The "original paper" that Forbes is referring to is a paper, in hindsight it may be referred to as a "preprint," I prepared in advance of the AAAS debate and that was freely circulated to participants and attendees. It was intended to be a technical section or appendix to a book that I would coauthor with West, but West never finalized his sections and the book was never completed.]* What follows is a revised version of Schoch's original paper, with the addition of detailed notes, which *KMT* requested and which help elucidate the geologist's conclusions. EDITOR)
[End of editorial introduction on page 53, and the actual article begins on page 53 as follows.]

REDATING THE GREAT SPHINX OF GIZA

By Robert M. Schoch

The Great Sphinx, carved out of limestones of the Eocene Mokattam Formation,[1] standing sixty-six feet (twenty meters) high and 240 feet (seventy-three meters) long, sits on the edge of the Giza Plateau (just west of Cairo, Egypt), east of the three great pyramids. Most Egyptologists currently attribute the carving of the Great Sphinx to King Khafre (Chephren) of the Old Kingdom's Fourth Dynasty, in approximately 2500 BCE by various chronologies.[2] In addition the so-called Sphinx Temple (situated directly in front of the Great Sphinx) and Valley Temple (on the Sphinx's right side) are also generally attributed to Khafre.[3]

As presently viewed, the Great Sphinx presents the image of a leonine body bearing a human head in a *nemes* headdress. It does not sit on top of the Giza Plateau—only its head and the very top of its back project above the general elevation of the surrounding plateau—but rests in the center of what appears to be the remains of an ancient quarry. The Sphinx is carved from local bedrock and faces directly east. In order to carve the body of the Sphinx, the ancient Egyptians dug a ditch or moat around it, such that the figure now sits in a hollow or depression, commonly referred to by such names as the "Sphinx ditch," the "Sphinx enclosure" or the "Sphinx quarry." The blocks of limestone removed from the Sphinx enclosure (in order to create the form of the body) were used to construct the so-called Sphinx Temple sitting directly due east of the Sphinx itself (in front of the paws of the sculpture) and the so-called Valley Temple located immediately south of the Sphinx Temple. The floor of the Sphinx enclosure is approximately sixty-five feet (twenty meters) above present-day mean sea level; this is probably near, or only a few meters above, the typical level of Nile flooding during various periods in ancient times.[4]

I have divided major geological and field evidence bearing on the age of the Great Sphinx into four main categories: (1) Weathering *[and Erosion]* Patterns, (2) Two-Stage Construction of the Sphinx and Valley Temples, (3) Ancient Repair Campaigns to the Body of the Sphinx and (4) Seismic Surveys of the Sphinx Area.

Weathering [and Erosion] *Patterns*

Modifications to rock surfaces—such as those resulting from weathering, erosion and paleosol development—have long been utilized as criteria in dating the relative ages when fresh rock surfaces were first exposed to the elements.[5] Such methodologies have been widely used to date Quaternary land surfaces in particular, but the same concepts can also be applied to other dating problems—such as the age of the initial carving of the Sphinx relative to other cultural features found on the Giza Plateau.

There appear to be four distinct forms or modes of weathering *[and erosion]* exhibited in this specific geologic area *[In hindsight, I was using the term* weathering *in a rather colloquial sense, to actually include in many cases both weathering (that is, the in situ breakdown of rock and various accompanying mineralogical changes) and erosion (the removal of the rock and mineral particles). A better term might have been* degradation *to encompass both weathering in a strict sense and erosion.]*:

(1) Precipitation-induced weathering *[and erosion]* is seen on the body of the Sphinx and in the ditch or hollow in which it is situated. This gives a rolling and undulating vertical profile to the weathered rocks and is very well-developed and prominent within the Sphinx enclosure. The rocks displaying this mode of weathering *[and erosion]* also often contain prominent vertical

crevices and other solution features, as well as cross-cutting diffusion fronts.[6] Many of the vertical and inclined solution features follow joints and faults in the bedrock. *[In discussing precipitation-induced weathering and erosion, in my 1992 paper I did not explicitly discuss rainfall runoff from the north and west of the Giza Plateau, although I did consider it and to some extent simply assumed that readers would understand that "precipitation-induced" weathering and erosion would include some level of runoff. I admit that to not explicitly mention rainfall runoff was an oversight, although I would point out that substantial rainfall runoff over and down the walls of the western end of the Sphinx Enclosure is diagrammatically illustrated in the 1993 NBC television documentary* The Mystery of the Sphinx, *in which I was involved and in which I prominently appear. Since my initial work on redating the Great Sphinx, geologist Colin Reader has developed his "rainfall run-off model," which complements and reinforces my work on redating the Great Sphinx (see further discussion in appendix 7).]*

(2) Wind-induced weathering and erosional features *[Here I explicitly mentioned erosion in the original paper; again, I was often using the term* weathering *colloquially to include both strict weathering and erosion.]* are seen on structures that are attributed unambiguously to Old Kingdom times. In this mode of weathering *[and erosion]*, the original profiles of the carved faces of tombs and other structures are still clearly visible (sometimes containing easily legible hieroglyphic inscriptions); but the softer, less competent layers of rock have been "picked out" by wind and sand abrasion, with the consequent formation of deeply eroded "wind-tunnel" features. This wind-induced weathering *[and erosion]* is distinctly different in nature from the precipitation-induced weathering *[and erosion]*; it is well exemplified on various Old Kingdom tombs and structures south and west of the Sphinx, which have been carved from the same sequence of limestones as the body of the great sculpture itself.

(3) Present on the body of the Sphinx, as well as on other Giza Plateau structures (and essentially forming an overlay on many precipitation-induced and wind-induced megascopic weathering *[and erosion]* features), are weathering *[and erosion]* features that are interpreted as resulting from relatively recent (within the last couple of centuries) efflorescing of dissolved and recrystallized minerals (such as halite) on the rock surfaces, which have subsequently flaked off and deteriorated the stone.[7] *[These weathering and erosional features are important, but are not responsible for the overall erosional morphology, as some of my critics have contended. In places, such as the western wall of the Sphinx Enclosure and else-where, one can observe flakes of rock weathering and eroding off parallel to the large-scale weathering and erosional features and/or artificially cut surfaces, and essentially preserving the overall morphology of those features, be they precipitation-induced weathering and erosion features, wind-induced weathering and erosion features, or ancient artificially produced surface features, such as chisel marks. On-site and observing such flakes weathering and eroding from the rocks, John Anthony West and I have jokingly referred to them as "Lehner flakes," as they preserve the surface morphology of the earlier carved and/or erosional features, such as ancient chisel marks on later dynastic tombs or, on older structures, evidence of rain at levels that did not exist during dynastic times, the latter being evidence that Mark Lehner has so vehemently attempted to deny or dismiss in order to preserve the standard orthodox chronology for the Sphinx and other structures on the Giza Plateau. Also, I would note that I currently accept that such weathering processes may have been taking place to a certain extent for millennia, and when they do occur such processes, promoting the disintegration or breaking down of the rock (that is, weathering), allow for more*

efficient erosion (that is, removal of the rock). In a series of 2006 exchanges with G. Vandecruys, Reader has made a compelling case that while these types of features are not to be ignored, and although the associated weathering processes have been active over the millennia, they do not account for the overall erosional morphology and distribution of erosional features seen on the walls of the Sphinx Enclosure. Rather, only rainfall runoff (not subsurface groundwater flow or "interflow," as Vandecruys contends, nor simple weathering due to condensation of water on the surfaces of the rocks, and so forth) can account for the erosional features and their distribution in the Sphinx Enclosure. (See the articles by C. Reader and G. Vandecruys cited in appendix 7.)]

(4) Weathering *[and erosion]* due to the dissolution and recrystallization of calcite and other minerals in the rocks is visible within various tombs and other chambers cut into the bedrock of the Giza Plateau. This may occur on a daily basis, as water condenses on the cool surfaces of these man-made caves, and subsequently evaporates once again as the temperature rises. This condensation and evaporation cycle gives the surface of the rock—and any carvings it may bear—almost the appearance of melted wax, at times covered with a very fine coating of mineral crystals. This is the most minor component of weathering *[and erosion]* observed on the Giza Plateau. It is preserved in only a limited number of artificial cave-like structures, such as tombs directly north of the Sphinx on the eastern edge of the Plateau.

Of the four modes of weathering *[and erosion]* listed above, some rocks may show one mode overlain by another—thus, in particular cases, the various modes of weathering *[and erosion]* may be somewhat difficult to sort out. On the whole, however, they are clear and distinct from one another at the Giza site.

What is interpreted as precipitation-induced weathering *[and erosion]* (number 1 above) is the oldest predominant weathering *[and erosion]* mode identified on the Plateau. It is found to any significant degree on only the oldest structures there, such as on the Sphinx body and the walls of the Sphinx enclosure. Of course, it still rains at Giza on occasion, and thus precipitation-induced weathering *[and erosion]* can be said to exist on all structures on the Plateau to some small degree; here we are talking in generalities and attempting to look at the broad picture. *[The precipitation-induced weathering and erosion is best developed along the far western wall of the Sphinx Enclosure and along the western end of the southern wall of the Sphinx Enclosure. Discussing his "rainfall run-off model," which, as noted above, complements and rein-forces my early work on the Great Sphinx, Reader notes, "This rainfall run-off model is fully consistent with the distribution of the degradation which is present within the Sphinx enclosure. Not only would rainfall run-off lead to more intense degradation in the western part of the Sphinx enclosure but the less intense degradation elsewhere is also explained. Comparatively little run-off will have discharged over the exposed faces in the east of the enclosure and the body of the Sphinx generated little run-off itself as it was isolated from the plateau by the surrounding excavation of the Sphinx enclosure" (C. Reader, 2002, "Giza Before the Fourth Dynasty.")* Journal of the Ancient Chronology Forum (JACF) *9 (2002), pp. 5-21. Available at* http://www.hallofmaat.com/modules.php?name=Articles&file=article&sid=93. *(Accessed November 15, 2016)]*

In many places this precipitation-induced weathering *[and erosion]* mode has superimposed upon it wind-induced weathering *[and erosion]* (number 2 above). Presumably the major portion of this precipitation-induced weathering *[and erosion, and water run-off features]* occurred prior to the onset of the current arid regime exhibited at Giza (i.e., prior to the modern climatic regime of the Sahara Desert).

On the Sakkara Plateau, some ten miles (sixteen kilometers) to the south of Giza, there are fragile mud-brick structures, mastabas, that are indisputably dated to the First and Second dynasties—presumably several hundred years earlier than the standard dating of the Sphinx—that exhibit no evidence of the precipitation-weathering *[and erosion]* features seen in the Sphinx enclosure. As noted above, well-documented Old Kingdom tombs at Giza, cut from the identical sequence of limestones as the body of the Sphinx, exhibit well-developed wind-weathering *[and erosion]* features, but lack significant weathering *[and erosion]* which is precipitation-induced. For these reasons it can be concluded that the well-developed precipitation-weathering *[and erosion]* features seen on the Great Sphinx and its associated structures predate Old Kingdom times and, in fact, may well predate dynastic times altogether. *[The point here is that if the climate had supported moderate to abundant rains during early dynastic and Old Kingdom times, then the Sakkara Plateau mud-brick mastabas would have suffered greatly. However, this is not the case, indicating that the limestone Sphinx and other structures, which show evidence of rains having caused major weathering and erosion, must predate the early Sakkara mastabas. Some of my critics have suggested that the Sakkara mastabas survived supposed early dynastic rains due to their higher elevation than the Sphinx, but I do not believe this is the case. Runoff or flashfloods would not have been necessary to cause water weathering and erosion to the dried mud brick; moderate rain coming down from above would have been sufficient to cause significant damage to the dried mud-brick structures.]*

The other two modes of weathering *[and erosion]* noted above (numbers 3 and 4) appear to be, on the whole, very recent phenomena that have been most active since ancient times *[I now acknowledge that these may have been more active in ancient times than I initially estimated, but this does not change the overall argument based on differing types of weathering and erosion seen on the Giza Plateau.]*. Other researchers have focused attention on such weatherings *[and erosions]* relative to the Sphinx, particularly the damage currently being done by mobilized salts.[8] These studies are of extreme importance in the attempt to halt the current destruction of the monument; but it must be remembered that such studies of weathering agents currently damaging the Sphinx may not be of *[direct]* relevance in any attempt at determining the genesis of ancient weathering and erosional features which are observable on it, as well.[9]

If the Great Sphinx of Giza was weathered *[and eroded]* heavily, and at an early period in its existence, by precipitation, this suggests that it initially may have been carved prior to the last great period of major precipitation in this part of the Nile Valley. Egypt was subjected to erratic floods and what is sometimes referred to as the "Nabtian Pluvial" (a period of relatively heavy rainfall) from 12,000 or 10,000 to about 5,000 years ago; and it has been suggested that there were sporadic but relatively heavy rains during the Fourth Millennium *[BCE]* (4000 to 3000 B.C.), and a less arid climate along the Nile as late as 2350 B.C. (with relatively wetter conditions and unusually high Nile inundations recorded sporadically during historical times).[10]

Thus, on the basis of the climatic history outlined above, one might tentatively suggest that the Great Sphinx was sculpted in very early dynastic times, or in the Predynastic Period (late-Fourth Millennium or earliest-Third Millennium B.C.). However, one must account for the considerable weathering *[and erosion]* that appears on the walls of the Sphinx hollow, on the body of the sculpture itself, and on the walls of its associated temples—weathering *[and erosion]* that was possibly covered up or repaired during the Old Kingdom (ca. 2600–2400 B.C.). One must also take seismic data into account (see below)—in particular, the fact that it indicates the subsurface dissolution of the limestone beneath the floor of the Sphinx enclosure is very deep and non-uniform. These latter considerations suggest the possibility that the initial carving of the Great Sphinx may have taken place several millennia earlier than its standard attribution.

Two-Stage Construction of the Sphinx and Valley Temples

As far as can be determined, the core of the Sphinx Temple (and possibly the core of the Valley Temple) is constructed out of titanic limestone blocks taken directly from the ditch around the Sphinx.[11] Therefore, the limestone core of the Sphinx Temple (and also possibly the Valley Temple) must be as old as the great sculpture itself. The ancient Egyptians later faced the limestone cores of these temples with ashlars made of Aswan granite. Based on my field observations of the granite ashlars and the underlying limestone core blocks, I believe that the core blocks in both temples were exposed to the elements and underwent considerable weathering and erosion before the granite facings were installed. In places the backs of the granite blocks were cut in irregular, undulating patterns so that they complemented or matched the irregular weathering [and erosion] patterns on the limestone blocks which they were used to refurbish. In observing the Valley Temple in particular, one also notes that the limestone walls, where stripped of their granite facings, are not cut smoothly. Rather, they have a higgledy-piggledy surface pattern, where apparently the ancient Egyptians, before applying the Aswan-granite facings, slightly cut back and smoothed out the weathered surface of the walls; they did not, however, take off enough of this weathered surface to make the walls perfectly smooth.

The general Egyptological community is in agreement that the granite facings on the Sphinx and Valley temples are attributable to King Khafre.[12] On site I found an inscription carved into the granite of the Valley Temple which appears,[13] on stylistic grounds, to be of Old Kingdom date.

It seems a good assumption that the limestone core blocks would have been freshly cut—that is, unweathered—when initially used in construction of the Sphinx-associated temples. Therefore, if the granite facings cover deeply weathered limestone, the original limestone structures must predate by a considerable degree their granite facings. Obviously, if the limestone cores (originating from the Sphinx ditch) predate the granite ashlars (facings), and the latter are attributable to Khafre of the Fourth Dynasty, then the Great Sphinx was carved prior to the reign of that king. *[It also might be the case that Khafre or another Old Kingdom pharaoh ordered the inscriptions carved onto preexisting granite ashlars. That is, the original limestone temple might be very old indeed. It may have been refurbished with granite at some later period, and at a still later period during Old Kingdom times the inscriptions were added.]*

Ancient Repair Campaigns to the Body of the Great Sphinx

The body of the Sphinx has been subjected to various repair campaigns, beginning with the ancient Egyptians themselves and continuing up to the present day. The earliest of these repairs to sculpted surfaces of the monument were carried out using what appear to be Old Kingdom-style masonry techniques.[14] If the oldest repairs to the eroded body of the sculpture do date to Old Kingdom times, this is another strong argument in favor of a much earlier date for its carving.

American Egyptologist Mark Lehner has analyzed the repairs to the Sphinx[15] and concluded that, despite his own evidence to the contrary, “To seek agreement with known historical facts [e.g., his contention, among other things, that the Sphinx was carved in ca. 2500 B.C. by order of Khafre], we should probably expect the earliest restoration to have been done in the New Kingdom [ca. 1500–1000 B.C.].”[16]*[Here it is pertinent to point out that the “known historical facts” are really just the* *assumptions of certain Egyptologists, and one can argue that Lehner's expectations are basically a type of circular reasoning. If a freshman college student used such reasoning in an assignment, he or she might well receive a failing grade. (Note: Material in brackets, but not italicized, in this paragraph occurs in the original 1992 article.)]*

In summary, in order to save the attribution of the Sphinx to King Khafre and ca. 2500 B.C., Lehner suggests that the earliest level of "large-block" (Old Kingdom-style?) masonry was added to the monument during the New Kingdom, over 1,000 years later. Furthermore, he points out that this still leaves only on the order of 500 years for the majority of the weathering and erosion experienced by the Sphinx to have occurred. *[This five hundred years is based on the estimate that for about half of the time during the millennium between the Old Kingdom and New Kingdom the Great Sphinx was buried up to its neck in sand, which served to protect the core body of the monument.]* Taking not only Lehner's work into account, but also the evidence for a two-stage construction of the Sphinx-associated temples (discussed above), the research that has been carried out concerning different modes of weathering *[and erosion]* on the Giza Plateau (discussed above), and the seismic surveys in the area of the Sphinx complex which give data on the subsurface depth and distribution of weathering around the monument (discussed below), and considering the fact that attribution of the carving of the Sphinx to Khafre is based on circumstantial evidence to begin with, I find one conclusion is inescapable: The initial carving of the core body of the colossal sculpture predated the time of Khafre. Lehner's own work is more easily reconciled with the hypothesis that the Fourth Dynasty Egyptians merely restored, refurbished and added on to the Sphinx and its neighboring structures, rather than being the original creators of this Giza Plateau complex.

Seismic Surveys of the Sphinx Area

Seismic geophysical surveys indicate that the subsurface weathering of the Sphinx enclosure is not uniform. This strongly suggests that the entire Sphinx ditch was not excavated at one time. Furthermore, by estimating when the less-weathered portion of this area was excavated—and thus first exposed subaerially—one can tentatively estimate when initial excavation of the Sphinx enclosure may have begun.

Thomas L. Dobecki, Ph.D., a seismologist with McBride-Ratcliff and Associates of Houston, Texas, assisted in carrying out some low-level *[that is, low-energy]* seismic work in the vicinity of the Great Sphinx; this was done with the permission of the Egyptian Antiquities Organization.[17] We were able to gather a quantity of seismic data, and with this we have been able to establish subsurface geometries of the bedrock and have located several previously unknown subsurface features.

Seismic lines taken in front of and along the body of the sculpture on either side—east (seismic line S4), north (seismic line S1) and south (seismic line S2) of the monument—indicate that below the surface the limestone is weathered up to a depth of six to eight feet (1.8 to 2.5 meters). However, along the back—west side (seismic line S3)—of the Sphinx the identical limestone has been weathered only to a depth of approximately four feet (1.2 meters). These results were completely unexpected. *[Actually, these results were not completely unexpected for me as even before the seismic work was carried out I was privately (I do not remember if I ever discussed it with anyone at the time) pondering the idea that the lower portion of the rump, the western end of the Sphinx, had been carved out subsequent to the primary carving of the body. This was suggested to me by the style of the carving seen on the lower elevation of the western end of the Sphinx Enclosure.]* The same limestone surrounds the great sculpture (the floor of the Sphinx enclosure where our seismic lines were taken consists of Gauri's[18] Rosetau

Member, or Member I), and if the entire body of the Sphinx was carved out of living rock at one time *[as the Egyptologists contended]*, it would be expected that the surrounding limestone would show the same depth of subsurface weathering. *[See further discussion in chapter 2.]*

One possible interpretation of this seismic data is that, initially, only the sides and front (eastern portion) of the Sphinx body were carved free of the surrounding rock, so that the sculpture projected as an outcropping, with what would later become the figure's rump or rear (western portion) still merged with the natural rock. To be more precise, the leonine rump was probably initially carved down only to the level of the upper terrace, which to this day remains immediately west of the sculpture within the general Sphinx enclosure; below the level of the terrace, the backside of the figure merged with the bedrock. Egyptian Egyptologist Selim Hassan[19] suggested that the Sphinx was originally meant to be viewed only from the front (rather than from the sides or rear), so that, with the Sphinx Temple in front of it, it seemed to sit upon a pedestal.

Alternately, the rump or western end of the sculpture may have been freed from the bedrock originally, but only by a very narrow passage not sampled by our April 1991 seismic line. *[That is, the area behind the Sphinx was excavated or widened at a later period, and it was this later widening or excavation that we sampled seismically; see further discussion below.]*

In order to determine accurately when the western end of the Great Sphinx was freed from the bedrock, and to establish a chronology of the possible widening of the passage between the rear portion of the sculpture and the west wall of the surrounding enclosure, more detailed work (including the collection of several more seismic profiles parallel to seismic line S3) will be necessary. However, it is already clear that the limestone floor behind the rump of the figure—which we sampled seismically in April 1991—was exposed later (i.e., possibly in Khafre's time) than the east, north and south limestone floors of the enclosure. Once the sides of the body and eastern end of the Sphinx were carved, the limestone floors surrounding these three sides of the sculpture began to weather; but what was to become the limestone floor behind the figure was still protected by a thick layer of solid rock.

A reasonable hypothesis is that when Khafre repaired and refurbished the Great Sphinx and its associated temples in ca. 2500 B.C., he had the back (western end) of the colossal sculpture carved out and freed from the cliff (or enclosure wall). It is difficult to argue that the rump of the figure was carved any later than Khafre's time; the base of the rump has, like the rest of the core body of the Sphinx, been weathered and repaired with limestone blocks. *[Note that the base of the rump has been weathered, eroded, and repaired, but the weathering and erosion may not be nearly as extensive and deep as on the sides and front of the Sphinx. There is no way to know without removing the repair blocks or otherwise making observations under them, which is not currently feasible.]* Furthermore, one must account for the non-trivial four feet (1.2 meters) of subsurface weathering detected in the area behind the carved figure, between the rump and the enclosure wall. If, for instance, one hypothesized that the rump of the Sphinx had been freed during New Kingdom restoration efforts to the sculpture, how could we account for this deep subsurface weathering, given the prevailing arid conditions on the Giza Plateau from New Kingdom times to the present and the historical fact that the Sphinx enclosure has been filled with desert sands for much of the period since the New Kingdom?

As an alternative to the scenario that Khafre had the back of the Sphinx carved free from the bedrock, one could suggest that if the rear portion of the figure already had been freed completely from the adjoining limestone prior to the Old Kingdom, but was separated from the resultant cliff by a very narrow passage, Khafre may have had this passage widened and therefore uncovered the limestone floor that we sampled seismically. (Our seismic line was positioned very close to the western wall of the Sphinx ditch.) Thus, at this time (ca. 2500 B.C.), the limestone floor on the western end of the sculpture began to weather.

Based on either this chain of reasoning, or the scenario suggested immediately above—and given that the weathering of the limestone floor of the Sphinx enclosure is fifty to 100 percent deeper on the front and sides of the figure than at its rear—we can estimate that the initial carving of the Great Sphinx (i.e., the carving of the main portion of the body and the front end) may have been carried out ca. 7000 to 5000 B.C. (in other words, that the carving of the core body of the figure is approximately fifty to 100 percent older than ca. 2500 B.C.). This tentative estimate is probably a minimum date; given that weathering rates may proceed non-linearly (the deeper the weathering is, the slower it may progress due to the fact that it is "protected" by the overlying material), the possibility remains open that the initial carving of the Great Sphinx may be even earlier than 9,000 years ago. *[This is a very important point. In 1992 I was being purposefully very "conservative" in my estimate of how far back the origins of the Great Sphinx might go. I now believe I severely underestimated the age of the original structure, the core body, of the Sphinx. Subsurface weathering rates are decidedly non-linear, and I am now comfortable with the notion that the origins of the Great Sphinx (the head was recarved in dynastic times), may go back to the end of the last ice age; that is, to circa 10,000 BCE. See discussion of the seismic data in particular in chapter 2, here.]*

In Search of a Context for the Great Sphinx

As a geologist, the current evidence taken as a whole suggests to me that the Great Sphinx of Giza is considerably older than its traditional attribution of ca. 2500 B.C. Indeed, I am currently estimating—based on evidence at hand—that the origin of the colossal sculpture can be traced to at least 7000 to 5000 B.C., and perhaps even earlier. Of course, the Sphinx may not have looked like it does today some 8,000 years ago. The original surface details of the body have weathered away in the distant past, and the current head of the figure—which everyone agrees is a dynastic head—is almost surely the result of recarving.

Certainly, the Great Sphinx has suffered much work, repairs, refurbishing and abuse from prehistoric times onward to the present. Special attention seems to have been paid to it periodically, for instance during the Old Kingdom (ca. 2500 B.C.), in New Kingdom times (ca. 1400 B.C.), in the Twenty-sixth Dynasty (or Late Period, ca. 650–400 B.C.) *[The Twenty-sixth Dynasty dates to ca. 664–525 BCE, and the Late Period generally refers to the period from approximately the Twenty-sixth Dynasty through the Persian conquest of Egypt to the coming of Alexander the Great in 332 BCE.]* and during the Graeco-Roman era (ca. 300 B.C.–400 A.D.). During these periods of repair or refurbishing activity, the contemporary ruler often had the Great Sphinx excavated from the sands that quickly (in just a matter of decades) fill its hollow enclosure if left unattended; and, after each re-excavation of the figure, repair blocks were often mortared to the weathered body in an attempt to restore the sculpture to its original outlines.[20]

As a general academic scholar, I have to ask myself whether the evident extreme age for the Great Sphinx that I am suggesting makes sense archaeologically and culturally. Dating this unique sculpture to the Seventh or Sixth Millennium B.C. (or perhaps even earlier)—is this compatible with the broad context of known archaeological remains? In other words, is there any context or precedent for a 7,000- or 9,000-yearold (or even older) colossal man-made monument? What were other Mediterranean peoples and cultures like at this time? What types of structures were they creating?

In taking a quick look at the relevant archaeological literature, I found that in Egypt for the period from about 10,000 to 5000 B.C. there is little known today that would suggest there were peoples capable

—either technologically or organizationally—of carving the Great Sphinx or building its associated temples.[21] However, the relatively simple Neolithic sites known in Egypt dating to this period may, in fact, be "backwater" peripheral or marginal settlements that were, and are, nonrepresentative of the highest level of Egyptian cultural and technological attainment at this time. Quite possibly other cultural remains are, for the most part, buried deep under the Nile alluvium. In addition, rises in sea level since ca. 10,000 or 15,000 years ago may have submerged vast expanses along the Mediterranean coast inhabited by early cultures.[22]

If we move beyond Egypt, however, we find that by the Eighth Millennium B.C. there were already major city-sites around the eastern end of the Mediterranean Sea. Two particularly well-attested examples are ancient Jericho in Palestine and Catal Hüyük in Turkey.

Catal Hüyük, a city built of mud bricks and timber, dates back to at least the late-Seventh Millennium B.C. This was no primitive settlement, however; rather, the known remains demonstrate a sophistication and opulence previously unimagined by archaeologists for such a remote period in time. The inhabitants built elaborate houses and shrines, covered walls with paintings and reliefs, and apparently had a rich and complex symbolic and religious tradition.[23]*[Since this was written, the magnificent site of Göbekli Tepe in southeastern Turkey has been partially excavated (see comments below). The megalithic and beautifully carved stone pillars found at Göbekli Tepe are arguably much more sophisticated than the mud-brick structures of Catal Hüyük, and Göbekli Tepe dates back several millennia earlier than Catal Hüyük. Catal Hüyük is representative of SIDA—the "solar-induced dark age"—that lasted from the end of the last ice age, ca. 9700 BCE, to the full reemergence of civilization during the fourth millennium BCE; see chapter 7 and appendix 9.]*

Jericho dates back to the Ninth Millennium B.C. and the city-site included a massive stone wall and tower, and a ditch cut in the bedrock—all dating from ca. 8000 B.C. The remains of the stone wall are at least six and one-half feet (two meters) thick and still stand in places twenty feet (six meters) high (nobody knows how high it was originally). Outside of this protecting wall, a ditch was excavated into the solid bedrock to a depth of nine feet (2.7 meters) and a width of twenty-seven feet (8.2 meters). Inside the wall are the remains of a stone tower thirty feet (9.1 meters) in diameter, the ruins of this structure still standing thirty feet (9.1 meters) high. In the center of the Jericho tower is a flight of steps built from huge stone slabs. This construction has been compared favorably to the towers seen on the great medieval castles of Europe.[24]

The evidence of Jericho, in particular, suggests that the Sphinx complex—the sculpture and its associated stone temples—would not have been a totally isolated phenomenon in the Neolithic world: Other massive stone structures were being built around the Mediterranean as early as 10,000 years ago. *[Since this paper was published in 1992, the "search for a context" for an older Great Sphinx has completely changed with the discovery of the incredibly sophisticated megalithic stone structures of Göbekli Tepe, dating back to the tenth millennium BCE, which I discuss in my 2012 book,* Forgotten Civilization: The Role of Solar Outbursts in Our Past and Future *(Rochester, Vt.: Inner Traditions). It should be emphasized that excavations at Göbekli Tepe did not begin until 1995, several years after my initial work on the Great Sphinx.]*

Where Do We Go from Here?

This is a project that is continuing to develop and unfold. More research is needed. An immediate task to be undertaken, in my opinion, is additional seismic studies within the Sphinx enclosure specifically, and on the Giza Plateau generally. I would also like to eventually acquire permission to sample the limestones of the Plateau. With such samples, I could perhaps determine more accurately the exact nature and mode of weathering *[and erosion]* observable on the Sphinx and other structures of the Plateau; and there is even the possibility of attempting to date the exposure age of the surface of the rock (which, in turn, could date the initial carving of the Sphinx) by measuring the concentration of isotopes produced *in situ* on the surface of the rock by the bombardment of cosmic rays.[25] Likewise, it would be extremely useful to be allowed to take some cores of the limestone, especially on the Plateau immediately adjacent to the Sphinx ditch, in order to look at the various weathering products and mineralogical changes produced at depth. I am also interested in trying to obtain some isotopic dates on the earliest mortar used in conjunction with the first repair campaigns to the Sphinx. *[Unfortunately, as of 2016, none of this work has taken place. It is not only a matter of time and money, but, perhaps more critically, also receiving permission from the Egyptian authorities to carry out such studies.]*

In presenting the hypothesis that initial carving of the Great Sphinx of Giza may predate its traditional attribution, it appears that I have stirred up much controversy within the Egyptological/archaeological community.[26] I have no desire to be the proponent of a controversial hypothesis; I am simply advocating a tentative assumption *[explanation or hypothesis]* that, in my opinion, best fits the evidence. My purpose is not to be dogmatic—I do not claim to have the "truth"—but simply to present a testable hypothesis relative to the age of the Sphinx. I am willing to see my explanation proven wrong on the basis of evidence outweighing the evidence which corroborates it. However, such empirical evidence as would falsify my hypothesis has, in my opinion, not yet been presented. I remain convinced, thus far, that the standard story told by Egyptologists as to when the Great Sphinx was created—namely, by Old Kingdom Egyptians during the reign of King Khafre—does not hold up under close examination.[27] *[In late 2016, as I review this article, I continue to stand by this statement.]*

NOTES

1. Recent work on the stratigraphy, sedimentology and general geology of the Giza Plateau is summarized in: T. Aigner, "Event-stratification in nummulite accumulations and in shell beds from the Eocene of Egypt," in G. Einsele and A. Seilacher, eds., *Cyclic and Event Stratification* (Berlin, 1982), 248–262; T. Aigner, "A Pliocene cliff-line around the Giza Pyramids Plateau, Egypt," *Palaeogeogr., Palaeoclimatol., Palaeoecol.* 42 (1983a), 313–322; T. Aigner, "Zur Geologie und Geoarchaeologie des Pyramidenplateaus van Giza, Aegypten," *Natur und Museum* 112 (1983b), 377–388; T. Aigner, "Facies and origin of nummulitic buildups: an exam-ple from the Giza Pyramids Plateau (Middle Eocene, Egypt)," *N. Jb. Geol. Palaont. Abh.* 166 (1983c), 347–368; K. O. Emery, "Weathering of the Great Pyramid," *J. Sediment. Petrol.* 30 (1960), 140–143; K. L. Gauri, "Geologic study of the Sphinx," *Newsletter of the American Research Center in Egypt* 127 (1984), 24–43; K. L. Gauri, "How Old is the Sphinx?" *Abstracts for the 1992 Annual Meeting of the American Association for the Advancement of Science* (Chicago), 202; K. L. Gauri and G. C. Holdren, "Deterioration of the stone of the Great Sphinx," *NARCE* 114 (1981), 35–47; Geological Survey of Egypt, Cairo, *Geological Map of Greater Cairo Area* (1983), Scale 1:100,000; M. Lehner, "The Development of the Giza Necropolis: The Khufu Project," *Mitt. des Deutschen Archaologischen lnst.*, Cairo, Abt. 41 (1985), 109–143; R. Said, *The Geology of Egypt* (Amsterdam, 1962); R. Said, *The Geological Evolution of the River Nile* (New York, 1981); R. Said, "The geological evolution of the River Nile in Egypt," *Z. Geomorphol., N.F.* 26 (1982), 305–314; R. Said, ed., *The Geology of Egypt*

(Rotterdam, 1990); R. Said and L. Martin, "Cairo Area geological excursion notes," in F. A. Reilly, ed., *Guidebook to the Geology and Archaeology of Egypt* (Petroleum Exploration Society of Libya, Sixth Annual Field Conference, 1964), 107–121; R. M. Schoch, "How Old is the Sphinx?," *Abstracts for the 1992 Annual Meeting of the American Association for the Advancement of Science* (Chicago, 1992), 202; R. M. Schoch and J. A. West, "Redating the Great Sphinx of Giza, Egypt," *Geological Society of America, abstracts with programs* 25:5 (1991), A253; M. Sears, "Nummulites: Time capsules of the desert sands," *Rotunda, The Magazine of the Royal Ontario Museum* 13:1 (Fall, 1990), 12–19.

2. For instance, J. Baines and J. Málek, *Atlas of Ancient Egypt* (Oxford, 1980), 36, state that Khafre (= Chephren, = Khephren *[=Khafra]*) ruled Egypt from 2520 to 2494 B.C.

3. "As to the exact age of the Sphinx, and to whom we should attribute its erection, no definite facts are known, and we have not one single contemporary inscription to enlighten us upon this point": from S. Hassan, *The Sphinx: Its History in the Light of Recent Excavations* (Cairo, 1949), 75.

The current standard attribution of the Great Sphinx and its associated temples to Khafre seems to be based on four major pieces of evidence: 1) a statue of Khafre recovered during the Nineteenth Century from the Valley Temple; 2) an ambiguous (and now effaced) inscription on a New Kingdom stela of ca. 1400 B.C.; 3) an alleged similarity between the face of the Great Sphinx and that of Khafre; and 4) the physical proximity of the Great Sphinx to Khafre's pyramid. *[Many Egyptologists have insisted that I am not taking the "context" of the Great Sphinx into account; in other words, it is surrounded by presumably Fourth Dynasty structures, and therefore it must date to the Fourth Dynasty as well. I never found this argument compelling, and since my 1992* KMT *article was published Colin Reader has put forth evidence that the Giza Plateau was used by ancient Egyptians prior to the Old Kingdom; see appendix 7.]* As Hassan and J. A. West (*Serpent in the Sky: The High Wisdom of Ancient Egypt* [New York, 1979], 215–220) and others have noted, all of this evidence is circumstantial and none of it proves that the Sphinx was carved by order of Khafre.

At present the consensus among Egyptologists seems to be that the face of the Great Sphinx resembles the face of its reputed builder, Khafre. This is a relatively recent notion, and far from certain. The face of the Sphinx is severely damaged, but what remains of it does not indisputably appear to resemble the face seen on known statues of Khafre. American Egyptologist Mark Lehner ("Computer rebuilds the Ancient Sphinx," *National Geographic* [April 1991], 32–39) has done work on restoring the battered face of the Great Sphinx, but his effort has not necessarily shed any light on what the face of the Sphinx originally looked like. Instead of attempting to reconstruct the face of the sculpture based on actual physical evidence, Lehner dogmatically insists that the monument was carved by Khafre's order and, therefore, the face must resemble that king; accordingly, he used a computer to reconstruct the face so that it looked like known portraits of the Fourth Dynasty ruler, remarking (*National Geographic*, 33) that "with the face of Khafre, the Sphinx came alive." Here Lehner clearly seems to imply that his reconstruction of the face of the Sphinx helps to confirm that the sculpture was created under Khafre; if so, this is simply a case of circular reasoning.

Recently New York City Police forensic officer Detective Frank Domingo made a detailed analysis of the face of the Sphinx, as compared to the known face of Khafre (see article by R. Grossman, *Chicago Tribune*, Section 5, 24 February 1992, 1,5). In October of 1991, Domingo traveled to Egypt with the express purpose of measuring and examining the surviving facial features of the Sphinx and the statues known to portray Khafre. After thoroughly studying the problem, Domingo concluded definitely that the face of the Great Sphinx is not the same face seen on statues of the builder of the second great pyramid *[that is, it is not the face of Khafre]*.

My hypothesis—that the initial carving of the Sphinx of Giza was undertaken prior to the reign of Khafre—is actually neither corroborated nor refuted on the basis of whether or not the face of the sculpture represents the likeness of Khafre. Even if the face of the Sphinx *is* a portrait of the Fourth Dynasty ruler, this does not falsify my hypothesis, as I believe that Khafre did, indeed, work on restoring and refurbishing the monument. He may have even ordered the recarving of the face of the Sphinx in his own image. *[Note that the latter is a possibility, but based on the evidence I do not believe it is the case.]*

4. Lehner has suggested (1985, 116) that along the eastern edge of the Giza Plateau (the area where the Sphinx is located) all land higher than an elevation of 60.7 feet (18.5 meters) above sea level remained above the annual inundations of the Nile during the Fourth Dynasty. In fact, Lehner (1985) found some suggestions of an Old Kingdom surface that is only 57.4 feet (17.5 meters) above sea level. As Lehner (1985, citing the work of K. Butzer) notes, the flood plains of the middle-Third Millennium B.C. (Old Kingdom times) have persisted in essentially the same form until the present day; there has not been a rise in the alluvial plain since the Old Kingdom period, as was once assumed.

Hassan (1949) stated that in the Old Kingdom, during the annual inundation of the Nile, barges could be floated right up to the edge of the Giza Plateau. Even in this century, unusually high Nile waters have flooded around the base of the Great Sphinx (Ali Hassan, personal conversation, June 1991).

In April of 1991, using seismic techniques, we located the water table at an elevation of about forty-six to forty-nine feet (fourteen to fifteen meters) above sea level in the sand-filled courtyard area approximately 328 feet (100 meters) east of the Sphinx Temple, between the modern restaurant and the Sphinx and Valley temples. In this courtyard area, the bedrock surface is buried under approximately forty-nine to fifty-nine feet (fifteen to eighteen meters) of sand; that is, the surface of the bedrock in this local area is at an elevation of about 6.6 to 16.4 feet (two to five meters) above sea level. The pyramids of the Giza Plateau sit at a higher elevation than does the Sphinx; thus, the base of Khafre's pyramid is situated at an elevation of approximately 230 feet (seventy meters) above sea level.

5. See references and discussion in R. M. Schoch, *Stratigraphy: Principles and Methods* (New York, 1989), 261.

6. See M. M. El Aref and E. Refai, "Paleokarst processes in the Eocene limestones of the Pyramids Plateau, Giza, Egypt," *J. Afr. Earth Sci.* 6 (1987), 367–377, who thoroughly describe these features.

7. It has been suggested that subsurface moisture migrating up into the Sphinx and the surrounding rocks of the Sphinx enclosure may account for much of this activity (see Gauri and Holdren, 1981). Alternatively, or complementarily to the migration of subsurface ground water, similar weathering is actively taking place during the present day, due to the condensation of atmospheric moisture on the rock. As described by K. L. Gauri, A. N. Chowdhury, N. J. Kulshreshtha and A. R. Punuru ("Geologic features and durability of limestones at the Sphinx," in P. G. Marinos and G. C. Koukis, eds., *Engineering Geology of Ancient Works, Monuments and Historical Sites* (Rotterdam, 1988), 723–729 [725–726]), "the moisture is able to condense as droplets of water in the cool of the night. This moisture forms concentrated salt solution, a process augmented by the hygroscopicity of the existing halite. The salt solution enters the pores under the influence of capillary force. At sunrise, as the water begins to evaporate, crystals of salt grow producing crystallization pressure. Often one can

hear in the morning the sound of popping stone resulting from pressures produced under the surface layers."

K. L. Gauri, G. C. Holdren and W. C. Vaughan ("Cleaning Efflorescences from Masonry," in J. R. Clifton, ed., Cleaning Stone and Masonry (Philadelphia, 1986], 3–13) have suggested that much of the deterioration of the Sphinx is due to the migration of salts under the influence of water originating from the atmosphere. These authors (Gauri, et. al., 4–5) state: "Burial of the Sphinx for centuries under the desert sand has, it appears, resulted in the migration of salts from the depth of the bedrock toward the surface. The authors deduced this phenomenon from observations made in the process of mapping the Sphinx geologically [Gauri, 1984], when sand was removed that had piled up in recent times against the rock surfaces bounding the ditch around the Sphinx. Even though the sand appeared dry at the surface, it was completely soaked with water a few inches below the surface. Also, the bedrock in contact with the sand was soaked with water. The source of this water is the atmosphere, and not the subsurface, because the water table lies many meters below the surfaces under consideration. Therefore, during the long burial of the Sphinx, the rock must have become wet to a considerable depth, and as it dried when exposed to the sun, salts must have become concentrated in the surface layers."

As noted by Lehner ("The ARCE Sphinx Project: A preliminary report," *NARCE* 112 [1980], 3–33), the vast majority of the weathering and erosion occurred to the Sphinx prior to ca. 1400 B.C. In places the walls of the Sphinx enclosure exhibit over a meter (3.3 feet) of erosion, and in places perhaps over two meters (6.5 feet) of erosion (see, for instance, the profile in Gauri, 1984, 32). It is hard to imagine that the mechanism of migrating salts, described in the quotation above, could be solely responsible for producing these deep-weathering *[and erosional]* features in the time span from 2500 B.C. (when Khafre allegedly had the Sphinx carved) to 1400 B.C. It is particularly difficult to reconcile Gauri et. al.'s proposed weathering mechanism with the observed surficial morphology of the rocks in consideration of the following points: 1) the Sphinx enclosure was probably buried in sand for at least half of the period between 2500 and 1400 B.C. (see Lehner, 1980); 2) the weathering *[and erosion]* patterns seen on the body of the Sphinx and walls of the Sphinx enclosure clearly exhibit features associated with precipitation-induced weathering *[and erosion]* (cf. El Aref and Refai, 1987); and 3) Old Kingdom tombs and other structures on the Giza Plateau that were carved from the same member of the Mokattam Formation do not exhibit the same weathering *[and erosion]* features to the degree seen on the Sphinx body and surrounding enclosure walls. If Gauri et al.'s mechanism of migrating salts since 2500 B.C. was the primary agent responsible for the weathering and erosional features seen on the body of the Sphinx, and on the walls of the Sphinx enclosure, then one should expect to observe such features of a similar nature and degree on the Old Kingdom tombs and other structures that are carved out of the same sequence of limestones as the body of the Sphinx, and that have been subjected to identical climatic and weathering conditions since they were constructed.

8. See, for instance, the work by Gauri and his colleagues cited above, as well as the following: A. N. Chowdhury, A. R. Punuru and K. L. Gauri, "Weathering of limestone beds at the Great Sphinx," *Environ. Geol. Water Sci.* 15 (1990), 217–223; K. L. Gauri and A. R. Punuru, "Characterization and durability of limestones determined through mercury intrusion porosimetry," in F. Zerra, ed., *The Conservation of Monuments in the Mediterranean Basin* (Proc. First Intern. Sympos. Bari, 1989), 255–258; A. R. Punuru, A. N. Chowdhury, N. J. Kulshreshtha and K. L. Gauri, "Control of porosity on durability of limestone at the Great Sphinx, Egypt," *Environ. Geol. Water Sci.* 15 (1990), 225–232. See also, C. Hedges, "Sphinx poses riddle about its fate: Experts ponder ways to save monument from man and time," *New York Times* (10 March 1992), C4.

9. In their work on the weathering of the Sphinx, Gauri and his colleagues (see references cited above) have suggested that, in general, the upper beds of the middle member (Member II or Setepet Member) of the core body or thoracic region of the Sphinx are more durable than the lower beds. These authors have calculated durability factors for different beds of this member; such factors range from about 100 (high durability) for the uppermost bed, just below the neck of the Sphinx, to about 11 for the lowermost bed of the member. There is a general trend of increasing durability factors, as calculated by these authors, going up section. Thus, their bed 4i (located approximately halfway up the body of the Sphinx) has a calculated durability factor of 75 (see summary of this work in Gauri et al., 1988).

The primary factor that determines the durability of the various beds, according to Gauri and colleagues, is the relative pore-size distributions in the various beds (they calculated their durability factors on the basis of the relative volume of the pores in various beds). In summary, stone with a greater volume of large pores will tend to be more durable. The reason for this is explained succinctly by Gauri et al. (1988, 727–728): "The influence upon durability of the interconnected small and large pores may also be visualized qualitatively in terms of transport of water through stone. Large pores become easily filled due to the mass movement of water into the pores. But when pores communicate with the exterior of the stone through narrow throats, the throats influence the filling of the large pores. Small (narrow) capillaries have large suction. An abundance of these capillaries will fill the small and large pores completely. But if many large pores are present and the small capillaries are somewhat larger, some empty space may then continue to exist in the stone. When crystals begin to grow in a solution, the resultant pressure will be experienced on the walls of the completely filled pores, but such pressure will be 'released' in the empty space of the partially filled pores. Consequently, stone with a large volume of large pores and a small volume of narrow capillaries will be more durable."

What determines the microporosity of a particular stone? It is a function of the original constitution of the rock as formed during deposition, diagenetic changes that modify primary textures and, finally, leaching of the rock matrix. The limestones composing the core body of the Sphinx are not uniform, as Gauri and colleagues have pointed out. These authors classify the lower half of Member II (their beds 1 through 3) as a sparse biomicrite and the upper half of Member II (their beds 4 through 7) as a packed biomicrite. In general, packed biomicrites might be expected to have a larger volume of large-pore space and, therefore, be characterized by higher durability factors than sparse biomicrite. Even taking this into account, Gauri et al's data show a consistent trend of increasing durability factors toward the top of the section within the packed biomicrites (beds 4–7).

How might we account for the trend noted for the packed biomicrites? I would suggest that this trend is compatible with the hypothesis that the stone was subjected to leaching of the matrix—which opened the pores and increased durability—due to precipitation. As rain fell on the back of the Sphinx (or, at least on the stone that was to become the Sphinx), and on the Giza Plateau in general, it would soak into and leach the rock from the top down giving rise to the pore-volume distribution seen in these rocks today.

It is interesting to note that on the wall of the Sphinx ditch the beds for which Gauri and colleagues calculated the highest durability factors are not consistently the least weathered and receded in profile (assuming that the wall of the Sphinx ditch was originally cut vertically or nearly vertically). *[It was probably slightly less than vertical, perhaps an 80º angle or so; either way the argument holds.]* For instance, utilizing Gauri's own data (Gauri, 1984, 32, fig. 3C), in an east-west profile of the rear of the Sphinx and the wall of the Sphinx ditch one sees that beds 1i and 2i—which both have low durability factors of 11—are greatly receded and undercut the over-lying units of higher durability (beds 1ii and 2ii). However, in the same section, bed 2ii (with a durability factor of 76) is receded further back than is bed 1ii (durability factor of 56). Likewise, bed 3ii (durability factor of 76) is receded back further than bed 3i (durability factor of 42), and beds 4i and 4ii (durability factors of 75 and 86 respectively) are receded further back than bed 3ii. In general, the amount that a bed has receded is not so much a function of its present-day durability factor, but primarily a function of its geometric position on the exposure. It would be logical that precipitation falling down from above *[as well as water runoff]* would preferentially weather *[and erode]* the uppermost beds and cause them to recede back at a faster rate than the lower beds. Again, this train of thought suggests that the Sphinx and walls of the Sphinx enclosure (or ditch) were subjected to precipitation-induced weathering *[and erosion]*.

There have been a few other previous studies of note concerning weathering and erosion on the Giza Plateau. Emery (1960), and Said and Martin (1964) discussed briefly the weathering to the pyramids, but their work is not directly applicable to the present discussion. More pertinent to the topic at hand, El Aref and Refai (1987) made a comprehensive macroscopic study of paleokarst processes and features on the Plateau, concentrating in particular on the area of the Sphinx enclosure. These authors pointed out many paleokarst features that are attributable to periods of seasonal rainfall. They illustrate and discuss solution holes, solution depressions, solution joints, symmetrical concentric cross-cutting diffusion fronts, and other dissolution features found on the body of the Sphinx and walls of the surrounding ditch. El Aref and Refai (1987, 376) note that "The karstic rocks are mantled by soil material and/or surficial calcareous duricrust. The solution features are partially or completely filled with clay precipitates together with concretions of iron and manganese oxides and collapse breccia fragments." (As a side note, these iron and manganese oxides often take on a red or ocher color. Lehner [1991, 36] noted that "if you probe any seam in the masonry covering the lower part of the body [of the Sphinx], a red powder appears." This may simply be red earthy/clay material, typical karst sediments that one would expect in such a limestone terrane that has been subjected to weathering via precipitation. Lehner [1991] and Hassan [1949] have both suggested that the Sphinx and its surroundings were traditionally painted red. This putative red paint, however, may actually consist, in part, of natural weathering products of the rock, although the Sphinx may have been artificially painted red, as well). *[The head of the Sphinx in particular may be partially dolomitic; it, as well as other limestones on the Giza Plateau, may contain dolomite and ankerite, which can form red or red-brown areas on the surface of the rock.]* El Aref and Refai conclude (1987, 376) that "The development of these karst features and the associated sediments indicate that the study area was subjected to intensive seasonal rainfall and evaporation of temperate (Mediterranean) climatic conditions."

Professor Farouk El-Baz has also noticed the anomalous and very ancient weathering *[and erosion]* seen on the core body of the Sphinx. However, in order to save the attribution of the sculpture to Khafre's reign, El-Baz has long promulgated his notion that the Great Sphinx of Giza is nothing more than a yardang (an aerodynamically stable natural erosional landform—essentially a wind-shaped hill) that was merely "dressed up" by the Old Kingdom Egyptians to look like a sphinx (F. El-Baz, "Desert builders knew a good thing when they saw it," *Smithsonian* [April 1981], 116–121; F. El-Baz, "Egypt's desert of promise," *National Geographic* [February 1982], 190–221). Thus, El-Baz believes that the Old Kingdom architects and sculptors incorporated very ancient (pre-Old Kingdom) erosional features found on a natural hill into their sculpting of the Sphinx.

Relative to the Great Sphinx of Giza, El-Baz's yardang hypothesis is untenable. The body of the Sphinx was not carved from a natural hill or yardang. In order to carve the figure's body, the ancient Egyptians had to excavate a ditch or moat around it, so that the full sculpture now sits in a hollow or depression below the general surface of the Giza Plateau. This ditch or hollow is clearly an artificial, man-made excavation, and it is well-established that the blocks removed from it were used to build the two structures today called the Sphinx and Valley temples. Certainly, the core body of the Sphinx was not a natural hill that was heavily eroded prior to being sculpted into the human-headed leonine figure. The head may have originally been a yardang, but it has been too heavily modified by carving and recarving to tell for sure at this point. *[I well remember as a graduate student at Yale, long before I had ever traveled to Egypt or became involved with research on the Sphinx, when El-Baz's yardang theory was published; everyone I knew made fun of it because all you have to do is look at a good photograph of the Great Sphinx to realize that it does not make sense! The Sphinx sits in a ditch or enclosure resulting from the quarrying of huge limestone blocks used to construct monumental buildings. Wind or other natural processes do not carve out blocks of rock and assemble them into buildings.]*

10. For a recent summary of the evidence bearing on the Holocene climatic history of northern Egypt, see Said (1990).

W. C. Hayes summarized (in his *Most Ancient Egypt* [Chicago, 1965, K. C. Seele, ed.], 23) much of the classical work carried out on reconstructing the climate of this period in Egypt's history when he wrote: "Toward the end of the sixth millennium B.C. Egypt and neighboring lands appear to have enjoyed another slight, but effective increase in temperature and precipitation and to have entered upon a prolonged sub-pluvial or relatively moist phase, extending from early Neolithic times until late in the Old Kingdom (ca. 5000–2350 B.C.). . . . Since the end of the third millennium B.C. the climate of Egypt has been generally similar to that of the present day. Between 2350 B.C. and A.D. 700 the average temperature seems to have been, if anything, a trifle above and the average rainfall a little below the modern levels, but with at least two 'quite moist' spells, one in late-Ramesside times [ca. 1200–1100 B.C.] and one about 850 B.C."

K. W. Butzer summarized his well-known work on the same topic (*Environment and Archaeology: An Ecological Approach to Prehistory* [Chicago, 1971], 584): "The Nile Valley provides further details and confirmation of several moist intervals. . . . A period of accelerated wadi activity that began 9200 B.C. terminated by 6000 B.C. Shell proliferations suggest rather more vegetation in the wadis. A little later, ca. 5000 B.C., a red paleosol suggests a mat of vegetation and more frequent gentle rains. Finally, after a second dry interlude, accelerated wadi activity and extensive sheet washing—in the wake of sporadic but heavy and protracted rains—are indicated ca. 4000–3000 B.C. Historical and archaeological documents suggest that the desert wadi vegetation of northern and eastern Egypt was more abundant as late as 2350 B.C., when the prevailing aridity was established."

11. See the work of Aigner (1983b) and Lehner (1980).

12. See, for instance, Z. A. Hawass, *The Pyramids of Ancient Egypt* (Pittsburgh, 1990).

13. See also I. E. S. Edwards, *The Pyramids of Egypt* (New York, 1985); L. Grinsell, *Egyptian Pyramids* (Gloucester, 1947); and Hawass (1990).

14. Gauri and his colleagues (see, for instance, Punuru et al, 1990, 230) consistently refer to these in such terms as "Pharaonic veneer stones" that have experienced "5,000 years of exposure to local conditions," that is, they were applied during Old Kingdom times. Recently Egyptian Egyptologist Zahi Hawass (Abstracts for *The First International Symposium on the Great Sphinx*—Toward Global Treatment of the Sphinx, Cairo 29 February–3 March 1992 [Egyptian Antiquities Organization, Cairo, 1992], 14) stated: "It seems that the Sphinx underwent restoration during the Old Kingdom because the analysis of samples found on the right rear leg proved to be of Old

Kingdom date.” *[See further discussion in appendix 7.]*

15. See Lehner (1980) and D. J. Hamblin (“A unique approach to unraveling the secrets of the Great Pyramids” [article about the work of M. Lehner], *Smithsonian* [April 1986], 78–93).

16. Lehner (1980), 18.

17. Nineteen refraction profiles, two reflection profiles and a refraction tomography data-set were collected on the Giza Plateau during April 1991. The seismic work performed around the base of the Sphinx consisted of hitting a sledgehammer on a steel plate, thus generating energy waves that entered the rock, traveled into the subsurface, and reflected and refracted off of subsurface features. In the Sphinx enclosure, refraction profiles gave us information on the subsurface weathering of the rock. In addition, we located various voids, cavities and other subsurface features (the subject of a paper currently being prepared by Dobecki and me *[subsequently published as: Thomas L. Dobecki and Robert M. Schoch. 1992. “Seismic Investigations in the Vicinity of the Great Sphinx of Giza, Egypt.”* Geoarchaeology *7, no. 6: 527–544.]*). For instance, the apparent thinner weathering around stations 150 to 160 feet (forty-five to forty-nine meters) on seismic line S2, taken along the south flank of the Sphinx, may not be real; it is probably due to induced resonance caused by a subsurface void. For a summary, in abstract form, of the April 1991 seismic survey of the Giza Plateau, see T. Dobecki, “How Old is the Sphinx?,” *Abstracts for the 1992 Annual Meeting of the American Association for the Advancement of Science* (Chicago, 1992), 202.

18. Gauri (1984). *[In this paper Gauri named the “members” of the Mokattam Formation (members are stratigraphic subunits of a geological rock formation) of which the body and head of the Great Sphinx are composed. From lower to higher, he called these the Rosetau Member (essentially making up the floor of the Sphinx Enclosure, as well as the lower portion of the western wall of the Sphinx Enclosure), the Setepet Member (the core body of the Sphinx is composed of this member), and the Akhet Member (forming the neck and head of the Sphinx). In the literature these members are often referred to as Members I, II, and III, respectively, numbering them from the bottom of the Sphinx Enclosure to the top; see further discussion in chapter 2, here.]*

19. Hassan (1949).

20. For popular discussions of the history of the Great Sphinx since Khafre’s time, see Baines and Málek, 1980; E. A. Wallis Budge, *A Guide to the Egyptian Collections of the British Museum* (London, 1909); Edwards, 1985; H. Goedicke, “Sphinx” in *Encyclopedia Americana*, International Edition 25 (1965), 403–404; Grinsell, 1947; Hassan, 1949; Hawass, 1990; Lehner, 1991; J. Málek, *In the Shadow of the Pyramids: Egypt during the Old Kingdom* (Norman, 1986); W. M. Flinders Petrie, *The Pyramids and Temples of Gizeh* (with an “Update” to the original 1883 edition by Z. Hawass, London, 1990); J. Putnam, *Egyptology: An Introduction to the History, Culture and Art of Ancient Egypt* (New York, 1990); and references cited in these works.

21. See M. A. Hoffman, *Egypt Before the Pharaohs* (New York, 1979), for a review of Predynastic Egypt.

22. M. Ters (“Variations in Holocene Sea Level on the French Atlantic Coast and Their Climatic Significance,” in M. R. Rampino, J. E. Sanders, W. S. Newman and L. K. Konigsson, eds., *Climate: History, Periodicity, and Predictability* [New York, 1987], 204–237) notes that “in general, the

mean level of the oceans has risen 60 m [200 feet] during the past 10,000 yr" [i.e., since 8000 B.C.]).

23. See D. J. Hamblin, *The First Cities* (New York, 1973), for a popular discussion of Catal Hüyük.

24. See Hamblin (1973) for a popular discussion of Jericho. Concerning Jericho and its potential relationship to Egypt, Hayes (1965, 92) had this to say: "Jericho lies a scant two hundred miles [320 km] to the east of the Nile Delta, and it would seem inevitable that a Neolithic, food-producing, village culture of the type attested there before 7000 B.C. should have reached northern Egypt from this immediately adjacent southwest Asian area in the course of the seventh or, at the latest, the sixth millennium B.C." Hayes (111) also points out that pendants found at the Sixth-to-Fifth Millennium *[BCE]* site of Merimda (Merimde beni-Salame; see Hoffman, 1979, 168–169), on the western edge of the Nile Delta about thirty-seven miles (sixty kilometers) northwest of Cairo, are very similar to pendants found in the early-Neolithic levels of Jericho. Baines and Málek (1980, 20) state that "contacts between Egypt and the Near East are attested already in the Predynastic Period, and the name of Narmer, the latest Predynastic [Egyptian] king, has been found at Tel Gat and Tel Arad in Palestine." Baines and Málek (31) illustrate a "probable route" for trade between Egypt and Palestine, and even suggest that there may have been an early (latest Predynastic? or the beginning of the Dynastic Period?) Egyptian settlement in southern Palestine.

25. See P. Bierman and A. Gillespie, "Range fires: A significant factor in exposure-age determination and geomorphic surface evolution," *Geology* 19 (1991), 641–644; T. Graf, C.P. Kohl, K. Marti and K. Nishiizumi, "Cosmic-ray produced neon in Antarctic rocks," *Geophysical Research Letters* 18 (1991), 203–206; and M.D. Kurz, "In situ production of terrestrial cosmogenic helium and some applications to geochronology," *Geochemica et Cosmochemica Acta* 50 (1986), 2855–2862; and references cited therein.

26. For comments made to the popular press by various archaeologists and Egyptologists, as well as general news coverage of the "Sphinx-age story," see, for example, articles printed in *The New York Times*, 24 October 1991 and 9 February 1992; *The Washington Post*, 11 November 1991 and 17 February 1992; *Newsday* (New York), 25 October 1991; *The Independent* (London), 14 October 1991; *USA Today*, 10 October 1991; *The Boston Globe*, 23 October 1991; *The San Diego Union*, 23 October 1991; *Los Angeles Times*, 23 October 1991; *The Chronicle of Higher Education*, 13 November 1991, 11 December 1991 and 15 January 1992; *The Egyptian Gazette*, 28 October 1991; *Vancouver Sun*, 28 October 1991; *International Herald Tribune*, 12 November 1991; *The San Francisco Chronicle*, 8 February 1992; *The Daily Telegraph* (London), 10 February 1992; and *The Houston Chronicle*, 23 October 1991 and 12 February 1992.

27. My research concerning the age of the Great Sphinx would not have been possible without the help and cooperation of many individuals and organizations. In particular, I thank Drs. Mohamed I. Bakr, Ali Hassan and Zahi Hawass (all of the Egyptian Antiquities Organization) for permission to pursue geological and geophysical studies on the Giza Plateau. I thank Drs. Gaber Barakat, L. Abdel-Khalek, M. M. El Aref and Eglal Refai (all of the Faculty of Science, Cairo University) for their interest, advice and help. Thomas Dobecki (McBride-Ratcliff and Associates, Houston) has provided valuable assistance with the geophysical studies on the Giza Plateau. Robert Eddy (College of Basic Studies *[since renamed the College of General Studies]*, Boston University) first introduced me to John Anthony West, and it was as a result of discussions with West that I became interested in the problem of the age of the Sphinx. Thus, West is responsible for initiating this

research and he, along with Boris Said, deserve credit for their hard work relative to the logistics of the Sphinx Project. Of course, all matters of fact and interpretation expressed in this paper are solely my responsibility.

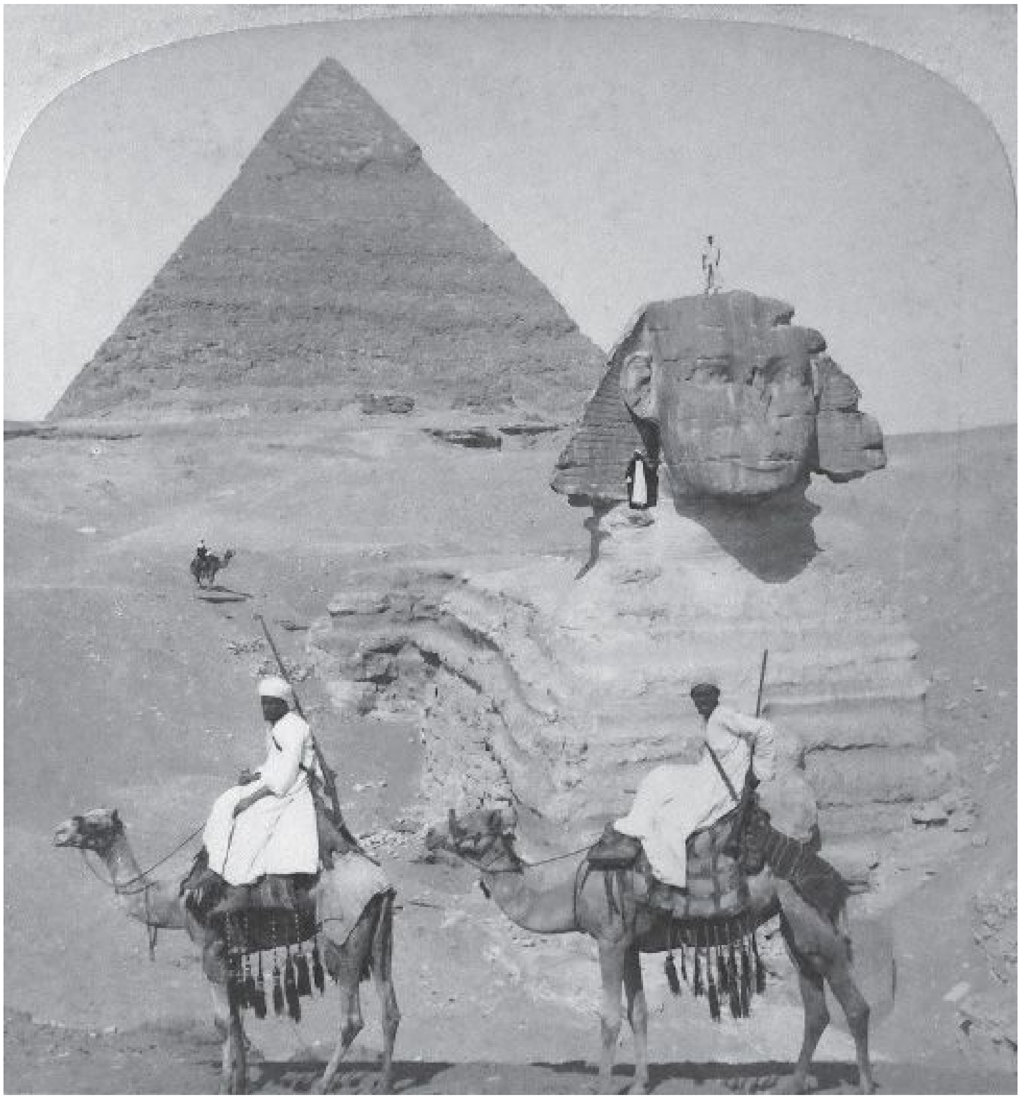


Fig. A6.1. The Great Sphinx with the Second Pyramid in the background, late nineteenth century. Photograph from a stereo view card, published by Underwood and Underwood. New York, 1896. (Collection of R. Schoch.)

APPENDIX 7

Geological Evidence Pertaining to the Age of the Great Sphinx, Including Replies to the Critics

Robert M. Schoch

The article reprinted in this appendix was written in 1999–2000 and published in slightly modified form in 2002–2003 in: Emilio Spedicato and Adalberto Notarpietro, editors, *New Scenarios on the Evolution of the Solar System and Consequences on History of Earth and Man*, Proceedings of the Conference, Milano and Bergamo, Italy, June 7–9th, 1999, Università degli Studi di Bergamo, Quaderni del Dipartmento di Matematica, Statistica, Informatica ed Applicazion, Serie Miscellanea, Anno 2002, N. 3, 171–203.

This paper served as an update and status report relative to my 1992 *KMT* article (see appendix 6). So as to stand alone, it purposefully repeated and elaborated on some of the material discussed in the 1992 *KMT* article; however, it also put forth new data and analyses, and responded to various critics of my work regarding the redating of the Great Sphinx. As the original article is virtually unobtainable, yet is still highly relevant and timely as well as of historical importance, it is reprinted here in full despite the slight repetition with the 1992 *KMT* article just noted. Together, this article, the 1992 *KMT* article, and the seismic analyses (discussed in chapter 2) form the foundation for the "water erosion theory" of the Great Sphinx—the contention that the core body of the Great Sphinx dates back to a period well prior to dynastic times. Many of the skeptics, debunkers, and scoffers who to this day continue to criticize my work in an attempt to uphold a circa 2500 BCE date for the Great Sphinx do nothing more than recycle and reiterate various invalid arguments that I addressed in 1999–2000. Comments below that appear in brackets and italics were added by me (Robert Schoch) in 2016.

GEOLOGICAL EVIDENCE PERTAINING TO THE AGE OF THE GREAT SPHINX

by Robert M. Schoch, Ph.D.

Abstract

Many recent Egyptologists have attributed the carving of the Great Sphinx of Giza to the Old Kingdom Pharaoh Khafre (Chephren), circa 2500 B.C. However, on the basis of a number of lines of geological, seismological, Egyptological, and related evidence, I have come to the conclusion that the structure commonly known as the Great Sphinx was built in stages (originally it may not have even been a Sphinx). Initial carving of the core body of the Sphinx is estimated to have taken place during the period of approximately 7,000 to 5,000 B.C. *[As discussed in chapters 2 and 7, I now believe that the core body of the Sphinx is older than my estimate at the time this paper was written.]* The Sphinx has subsequently been reworked and refurbished many times over the succeeding millennia—including, probably, during the reign of Khafre. In particular, the rump or rear of the Sphinx was carved out or recarved much later than the core body, and the head of the Sphinx has been recarved.

My geological work suggests that Khafre merely restored the Sphinx. The body of the Sphinx, carved from the local bedrock and thus sitting in the bottom of an artificial hollow (ditch or enclosure), and the walls of the Sphinx enclosure exhibit well-developed precipitation-induced (rainfall runoff) weathering, erosion, and degradation (characterized by a rolling and undulating vertical profile) not typically seen on Old Kingdom Giza Plateau structures (which exhibit primarily wind-induced weathering *[and erosion]* marked by a more angular profile with soft layers removed by wind abrasion) also excavated from the Mokattam limestone. This deep precipitation-induced weathering *[and erosion]* of the Sphinx is interpreted as predating the current arid regime of the area, and thus indicates that the body of the Sphinx predates Old Kingdom times by perhaps several millennia. Though we continue to refine our knowledge of the details of the paleoclimatic history of the Giza Plateau over the last 10,000 years *[the last 15,000 years]*, we already know enough to associate certain dominant modes of weathering with certain parts of that climatic history. Portions of the Sphinx predate Old Kingdom times.

The so-called Sphinx Temple, located just east of the Great Sphinx, is built of limestone coreblocks taken from the ditch quarried out to form the body of the Sphinx. These coreblocks were faced with Aswan granite attributed to Khafre, but the coreblocks were already deeply weathered when the granite facing was originally applied. The same scenario may be true for the so-called Valley Temple just south of the Sphinx Temple. The first of several ancient repair campaigns to the weathered body of the Sphinx was done with typical Old Kingdom style masonry, but the core body of the Sphinx was already deeply weathered when this earliest repair work was carried out. Corroborative evidence for an older Sphinx includes low-energy seismic refraction data that records up to 100% deeper weathering below the original floor of the Sphinx enclosure as compared to weathering seen in the identical limestones in an area presumably quarried during Khafre's time in the rear of the Sphinx enclosure.

Introduction

The Great Sphinx, carved out of limestones of the Eocene Mokattam Formation, standing 66 feet (20 meters) high and 240 feet (73 meters) long, sits on the edge of the Giza Plateau (just west of Cairo, Egypt) east of the three great pyramids. Most recent Egyptologists have attributed the carving of the Great Sphinx to the time of the Old Kingdom Fourth Dynasty Pharaoh Khafre (Chephren), approximately 2500 B.C. by various standard chronologies. In addition the so-called Sphinx Temple (sitting directly in front of the Great Sphinx) and Valley Temple (on the Sphinx's right side) are also attributed to Khafre (Lehner, 1992b, 1997).

For many years the independent Egyptologist John Anthony West (see West, 1979, 1987, 1989, 1993a), based on the work of the late R. A. Schwaller de Lubicz (see Schwaller de Lubicz, 1982), has promulgated an interesting hypothesis: that the Great Sphinx of Giza may be older than its traditional attribution. Primarily on the basis of weathering and erosional features seen on the Great Sphinx and its associated temples, as compared to weathering seen on other structures attributed to the Fourth Dynasty, West suggested that the Sphinx may predate the Fourth Dynasty. West contacted me concerning his hypothesis in 1989, and although I was extremely skeptical of his ideas I did agree to look into it from a geological perspective. Beginning during the summer of 1990 West and I began to research this problem in earnest, including several expeditions to Egypt specifically to look at the evidence bearing on the age of the Great Sphinx (see Schoch, 1992a, 1992b, 1992c, 1992d, 1992e, 1993a, 1993b, 1994a, 1994b, 1995a, 1995b, 2000; Schoch with McNally, 1999, 2000; Schoch and West, 1991; West, 1993a, 1993b; see also Moore, 1992, *[Moran, 1998]*, and Payn, 1992 *[West et al., 1997; Schoch and West, 2000]*).

Summary of Geological and Field Evidence Bearing on the Age of the Sphinx

Major geological and field evidence bearing on the age of the Great Sphinx is summarized in this section. I have divided this evidence into four main categories:

1) Weathering *[and Erosion]* Patterns, 2) Two-Stage Construction of the Sphinx and Valley Temples, 3) Ancient Repair Campaigns to the Body of the Sphinx, and 4) Seismic Surveys of the Sphinx Area.

Weathering [and Erosion] Patterns

Modifications to rock surfaces, such as those resulting from weathering, erosion, and paleosol development, have long been utilized as criteria in determining the relative times since fresh rock surfaces were first exposed to the elements (see, for example, Brookes, 1985; Coates, 1984; Evans, 1985; Finkl, 1984; and Vreeken, 1984). Such methodologies have been widely used to date Quaternary land surfaces in particular, but the same concepts can also be applied to other dating problems—such as the age of the initial carving of the Sphinx relative to other cultural features found on the Giza Plateau.

There appear to be four distinct forms or modes of weathering and erosion (degradation) exhibited on the Giza Plateau.

1) Precipitation-induced weathering and erosion is seen on the body of the Sphinx and in the ditch or hollow surrounding the Great Sphinx. This gives a rolling and undulating vertical profile to the weathered *[and eroded]* rocks, and is very well-developed and prominent within the Sphinx enclosure. The rocks that display this mode of weathering *[and erosion]* also often contain prominent vertical crevices and other solution features, as well as crosscutting diffusion fronts (see El Aref and Refai, 1987 [discussed further below], who thoroughly describe these features; see also Issawi, 1992, p. 17, who notes that “in parts of the statue [the Sphinx], the limestone is highly porous and cavernous showing evidences of being greatly affected by water erosion.”). Many of the vertical and inclined solution features follow joints and faults in the bedrock.

2) Wind-induced weathering and erosional features are seen on structures that are attributed unambiguously to Old Kingdom times. In this mode of weathering *[and erosion]* the original profiles of the carved faces *[facades]* of tombs and other structures are still clearly visible (sometimes containing easily legible hieroglyphic inscriptions) but the softer, less competent

layers of rock have been "picked out" by wind and sand abrasion with the consequent formation of deeply eroded "wind-tunnel" features that give a relatively angular profile to the vertical rock surface. This wind-induced weathering *[and erosion]* is distinctly different in nature from the precipitation-induced weathering *[and erosion]*; it is well exemplified on various Old Kingdom tombs (such as on the tomb of Debhem *[or Debehen]*, a late Old Kingdom overseer [illustrated in Schoch, 1992d, p. 57]) *[The photo I referred to is reproduced in chapter 7, as figure 7.20.]* and structures south and west of the Sphinx which have been carved from the same sequence of limestones as the body of the Sphinx. Wind-induced weathering *[and erosion]* is also observed on the present head of the Great Sphinx and to a certain degree on the uppermost portion of the back of the Sphinx as well as on the uppermost limestone blocks of the Valley and Sphinx Temples. Wind-induced weathering *[and erosion]* features in the Sphinx enclosure form a relatively minor overlay on the precipitation-induced weathering *[and erosion]* features observed on the body of the Sphinx and on the walls of the enclosure. This wind-induced weathering *[and erosion]* may be due in part to the hot, dry, dust-laden khamsin winds that seasonally (March to mid-June) originate from the interior of the Sahara Desert and blow over the country.

3) Present on the body of the Sphinx, as well as on other structures (and essentially forming an overlay on many precipitation-induced and wind-induced megascopic weathering *[and erosion]* features), are weathering *[and erosion]* features that are interpreted as the result of relatively recent (within the last couple of centuries) efflorescing of dissolved and recrystallized minerals (such as halite) on the surface of the rock which have subsequently flaked off and deteriorated the stone. It has been suggested that subsurface moisture migrating up into the Sphinx and the surrounding rocks may account for much of this activity (see Gauri and Holdren, 1981 *[see also Gauri, 1981/1982]*). Alternatively, or complementarily to the migration of subsurface groundwater, similar weathering is actively taking place during the present day due to the condensation of atmospheric moisture on the rock. As described by Gauri, Chowdhury, Kulshreshtha, and Punuru (1988, pp. 725–726), "the moisture is able to condense as droplets of water in the cool of the night. This moisture forms concentrated salt solution, a process augmented by the hygroscopicity of the existing halite. The salt solution enters the pores under the influence of capillary force. At sunrise, as the water begins to evaporate, crystals of salt grow producing crystallization pressure. Often one can hear in the morning the sound of popping stone resulting from pressures produced under the surface layers."

Gauri, Holdren, and Vaughan (1986) have suggested that much of the deterioration of the Sphinx is due to the migration of salts under the influence of water originating from the atmosphere. These authors (Gauri et al., 1986, pp. 4–5) state: "Burial of the Sphinx for centuries under the desert sand has, it appears, resulted in the migration of salts from the depth of the bedrock toward the surface. The authors deduced this phenomenon from observations made in the process of mapping the Sphinx geologically [Gauri, 1984], when sand was removed that had piled up in recent times against the rock surfaces bounding the ditch around the Sphinx. Even though the sand appeared dry at the surface, it was completely soaked with water a few inches below the surface. Also, the bedrock in contact with the sand was soaked with water. The source of this water is the atmosphere, and not the subsurface, because the water table lies many meters below the surfaces under consideration. Therefore, during the long burial of the Sphinx, the rock must have become wet to a considerable depth, and as it dried when exposed to the sun, the salts must have become concentrated in the surface layers."

As is pointed out later in this paper (see section on "Ancient Repair Campaigns to the Body of the Sphinx"), the vast majority of the weathering and erosion occurred to the Sphinx prior to circa 1400 B.C. In places the walls of the Sphinx enclosure exhibit over a meter (3.3 feet) of erosion, and in places perhaps over two meters (6.5 feet) of erosion (see, for instance, the profile in Gauri, 1984, p. 32). It is hard to imagine that the mechanism of migrating salts, described in the last paragraph (quoted from Gauri et al., 1986), could be solely responsible for producing these deep weathering features in the time span from 2500 B.C. (when Khafre presumably had the Sphinx carved) to 1400 B.C. It is particularly difficult to reconcile Gauri et al.'s (1986) proposed weathering mechanism with the observed surficial morphology of the rocks in consideration of the following points: 1) As is described below, the Sphinx enclosure may have been buried in sand for at least half of the period between 2500 B.C. and 1400 B.C.; 2) the weathering patterns seen on the body of the Sphinx and the walls of the Sphinx enclosure clearly exhibit features associated with precipitation-induced weathering *[and erosion]* (cf. El Aref and Refai, 1987); and 3) as has already been pointed out, Old Kingdom tombs and other structures on the Giza Plateau that were carved from the same member of the Mokattam Formation do not exhibit the same weathering features to the degree seen on the body of the Sphinx and the walls of the Sphinx enclosure. If Gauri et al.'s (1986) mechanism of migrating salts since 2500 B.C. was the primary agent responsible for the weathering and erosional features seen on the body of the Sphinx and on the walls of the Sphinx enclosure, then one should expect to observe weathering and erosional features of a similar nature and degree on the Old Kingdom tombs and other structures that are carved out of the same sequence of limestones as the body of the Sphinx.

4) Weathering *[and erosion]* due to the dissolution and recrystallization of calcite and other minerals in the rocks is visible within various tombs and chambers cut into the bedrock of the Giza Plateau. This may occur on a daily basis as water condenses on the cool surfaces of these man-made caves, and subsequently evaporates once again as the temperature rises; this gives the surface of the rock, and any carvings it may bear, almost the appearance of slightly melted wax, at times covered with a very fine coat of mineral crystals. This is the most minor component of weathering observed on the Giza Plateau. It is preserved in only a limited number of tombs and other artificial cave-like structures, such as tombs directly north of the Sphinx on the eastern edge of the Giza Plateau.

Of the four modes of weathering *[and erosion]* listed above, some rocks may show one mode of weathering *[and erosion]* overlain by another—thus in particular cases the various modes of weathering *[and erosion]* may be somewhat difficult to sort out. On the whole, however, they are clear and distinct from one another on the Giza Plateau.

What is interpreted as precipitation-induced weathering and erosion (#1, above) is the oldest predominant mode of weathering *[and erosion]* identified on the Giza Plateau. It is found only on the oldest structures of the Giza Plateau to any significant degree, such as the body of the Sphinx and the walls of the Sphinx enclosure. Of course it still rains on the Giza Plateau occasionally, and thus precipitation-induced weathering *[and erosion]* can be said to be found on all Giza Plateau structures to some small degree; here we are talking in generalities and attempting to look at the broad picture. In many places this precipitation-induced mode of weathering *[and erosion]* has superimposed upon it wind-induced weathering *[and erosion]* (#2, above). Presumably the major portion of this precipitation-induced weathering *[and erosion]* occurred prior to the onset of the current arid regime exhibited on the

Giza Plateau (i.e., prior to the modern climatic regime of the Sahara Desert). On the Saqqara *[Sakkara]* Plateau (about 10 miles [16 km] from Giza) there are fragile mudbrick mastabas that are indisputably dated to the first and second dynasties (presumably several hundred years earlier than the standard dating of the Sphinx) that exhibit no evidence of the precipitation-induced weathering *[and erosion]* seen in the Sphinx enclosure. Indeed, the mudbrick mastabas on the Saqqara Plateau have been preserved by being buried in dry, wind-swept sand, indicating that extremely arid conditions have persisted in this part of Egypt since early Old Kingdom times. As noted above, well-documented Old Kingdom tombs on the Giza Plateau, cut from the identical sequence of limestones as the body of the Sphinx, exhibit well-developed wind-induced weathering *[and erosional]* features but lack significant precipitation-induced weathering *[and erosional]* features. For these reasons it can be concluded that the well-developed precipitation-induced weathering *[and erosional]* features seen on the Great Sphinx and associated structures predate Old Kingdom times, and in fact may well predate dynastic times.

The other two modes of weathering *[and erosion]* noted above (#3, efflorescing of dissolved and recrystallized minerals, and #4, dissolution and recrystallization of calcite) appear to be, on the whole, phenomena that have been significant only recently. In the 1960s the Aswan High Dam was built, and this, along with the accompanying intense agriculture and the generally burgeoning population of Egypt, has served to raise water table levels generally throughout the lands along the Nile. The annual floods of the Nile are now largely controlled artificially, and the water level of the Nile no longer is allowed to rise and fall as it did in earlier times. This means that salts which were once flushed from the rocks on a regular basis now accumulate and deteriorate stone monuments and buildings. Hillel (1991, pp. 148–149) describes the current situation in Egypt as follows:

> Intensified irrigation and the maintenance of the water level in the Nile have afflicted Egypt with still another salinity problem beyond its irrigated lands. Instead of being flushed out, as they were in the past, by receding flood waters, the salts that now remain in the groundwater are infused by capillary action into the porous soil and rocks. Water piped in to supply the needs of the expanding population of towns and villages along the Nile, and cesspools placed underground to dispose of their waters, have further raised the water table. As a result, there is now a constant upward seepage of salt-bearing moisture into Egypt's ancient temples and monuments, and these salts impregnate the porous stone walls.
>
> As they say in Egypt, "salt is like a sleeping devil—only when it gets moist does it start to act." When the moisture evaporates at the exposed surfaces of these structures, the salts recrystallize, forcing apart the grains of stone. The result is a flaking and crumbling of the ornately carved reliefs and inscriptions of Egypt's magnificent monuments. Salt bubbling up under the ancient wall paintings pushes the plaster off the walls, so that the exquisitely drawn and brightly colored portraits of the ancient kings, queens, and gods, as well as the vivid depictions of landscapes and scenes of daily life (notably including farming activities), are now deteriorating rapidly. If this deterioration continues for a few more decades, many and perhaps most of the reliefs and paintings adorning the ancient temples and graves will be erased from within, and only blank, pulverized surfaces of walls and columns will be left.

All of these detrimental effects of rising water tables are currently exhibited on the body of the Sphinx, and around the area of the Giza Plateau generally. Other researchers have focused attention on these modes of weathering relative to the Sphinx, particularly the damage currently being done by mobilized salts (see for instance the work by Gauri and Holdren, 1981; Chowdhury et al., 1990; Punuru et al., 1990; Gauri and Punuru, 1989; Gauri et al, 1986; Gauri et al., 1988; Gauri, 1992; see also the article by Brock, 1990). These studies are of extreme importance in attempting to halt the current destruction of the Sphinx (Brookes, 1992; Egyptian Antiquities Organization, 1992; Hedges, 1992). It must be remembered, however, that studies of the weathering agents currently damaging the Great Sphinx may not be of relevance when attempting to determine the genesis of ancient weathering and erosional features on the Sphinx.

In their work on the weathering *[and erosion]* of the Sphinx, Gauri and his colleagues (see references cited above) have suggested that in general the upper beds of the middle member (Member II or Setepet Member) of the core body or thoracic region of the Sphinx are more durable than the lower beds of this member. These workers have calculated durability factors for different beds of this member; such factors range from about 100 (high durability) for the uppermost bed just below the neck of the Sphinx to about 11 for the lowermost bed of the member. There is a general trend of increasing durability factors, as calculated by these authors, going up section. Thus their bed 4i (located approximately halfway up the body of the Sphinx) has a calculated durability factor of 75 (see summary of this work in Gauri et al., 1988).

It is significant to note that on the wall of the Sphinx ditch the beds for which Gauri et al. calculate the highest durability factors are not consistently the least weathered and receded in profile (assuming that the wall of the Sphinx ditch was originally cut vertically or nearly vertically, perhaps at an angle of 80 degrees or so). For instance, utilizing Gauri's own data (Gauri, 1984, p. 32, fig. 3C), in an east-west profile of the rear of the Sphinx and the wall of the Sphinx ditch one sees that beds 1i and 2i, which both have low durability factors of 11, are greatly receded and undercut the overlying units of higher durability (beds 1ii and 2ii). However, in the same section bed 2ii (with a durability factor of 76) is receded further back than is the lower-lying bed 1ii (durability factor of 56). Likewise, bed 3ii (durability factor of 76) is receded further back than the underlying bed 3i (durability factor of 42), and beds 4i and 4ii (durability factors of 75 and 86 respectively) are receded further back than the lower-lying bed 3ii. In general, the amount that a bed has receded is not so much a function of its present-day durability factor, but primarily a function of its geometric position on the exposure. It would be logical that precipitation falling down from above *[as well as rainfall runoff]* would preferentially weather *[and erode]* the uppermost beds and cause them to recede back at a faster rate than the lower beds. Again, this train of thought suggests that the Sphinx and walls of the Sphinx ditch were subjected to precipitation-induced weathering *[and erosion]*.

There have been a few other previous studies of note concerning weathering and erosion on the Giza Plateau. Emery (1960) and Said and Martin (1964) discussed briefly the weathering to the pyramids, but their work is not directly applicable to the present discussion. More pertinent to the topic at hand, El Aref and Refai (1987) made a comprehensive macroscopic study of paleokarst processes and features on the Giza Plateau, concentrating in particular on the area of the Sphinx enclosure. These authors pointed out many paleokarst features that are attributable to periods of seasonal rainfall. They illustrate and discuss solution holes, solution depressions, solution joints, symmetrical concentric cross-cutting diffusion fronts, and other dissolution features found on the body of the Sphinx and on the walls of the Sphinx ditch. El Aref and Refai (1987, p. 376) note that "The karstic rocks are mantled by soil material and/or surficial calcareous duricrust. The solution features are partially or completely filled with clay precipitates together with concretions of iron and manganese oxides and collapse breccia fragments." (As a side note, these iron and manganese oxides often take on a red or ocher color. Lehner [1991, p. 36] noted that "if you probe any seam in the masonry covering the lower part of the body [of the Sphinx], a red powder appears." This may simply be red earthy/clay material, typical karst sediments that one would expect in such a limestone terrane that has been subjected to weathering via precipitation. Lehner [1991] and

Hassan [1949] both suggest that the Sphinx and surroundings were traditionally painted red. This putative red paint, however, may actually consist, in part, of natural weathering products of the rock, although the Sphinx may have been artificially painted red also.) El Aref and Refai conclude (1987, p. 376) that "The development of these karst features and the associated sediments indicate that the study area was subjected to intensive seasonal rainfall and evaporation of temperate (Mediterranean) climatic conditions."

If the Great Sphinx was weathered *[and eroded]* heavily, and at an early period, by precipitation, this suggests that it may have been carved prior to the last period of major precipitation in this part of Egypt. Egypt was subjected to erratic floods and what is sometimes referred to as the "Nabtian Pluvial" (a period of relatively heavy rainfall) from 12,000 or 10,000 to about 5,000 years ago, and it has been suggested that there were sporadic but relatively heavy rains during the fourth millennium (4,000 to 3,000) B.C., and a less arid climate along the Nile as late as the middle of the third millennium B.C. (with relatively wetter conditions and unusually high Nile floods recorded sporadically during historical times; for a recent summary of the evidence bearing on the Holocene climatic history of northern Egypt see Said, 1990; see also Bower and Lubell, 1988; Clark and Brandt, 1984; Close, 1987; Holmes, 1989; and references cited therein).

Hayes (1965, p. 23) summarized much of the classical work carried out on reconstructing the climate of this period in Egypt's history when he wrote: "Toward the end of the sixth millennium B.C. Egypt and neighboring lands appear to have enjoyed another slight, but effective increase in temperature and precipitation and to have entered upon a prolonged sub-pluvial or relatively moist phase, extending from early Neolithic times until late in the Old Kingdom (ca. 5000–2350 B.C.). . . . Since the end of the third millennium B.C. the climate of Egypt has been generally similar to that of the present day. Between 2350 B.C. and A.D. 700 the average temperature seems to have been, if anything, a trifle above and the average rainfall a little below the modern levels, but with at least two 'quite moist' spells, one in late Ramesside times [circa 1200–1100 B.C.] and one about 850 B.C."

Butzer (1971, p. 584) summarized his well-known work on the same topic as such: "The Nile Valley provides further details and confirmation of several moist intervals. . . . A period of accelerated wadi activity that began 9200 B.C. terminated by 6000 B.C. Shell proliferations suggest rather more vegetation in the wadis. A little later, ca. 5000 B.C., a red paleosol suggests a mat of vegetation and more frequent gentle rains. Finally, after a second dry interlude, accelerated wadi activity and extensive sheet washing —in the wake of sporadic but heavy and protracted rains—are indicated circa 4000–3000 B.C. Historical and archeological documents suggest that the desert wadi vegetation of northern and eastern Egypt was more abundant as late as 2350 B.C., when the prevailing aridity was established." Needler (1984, p. 17) summarized the relevant climatic history as follows: "In the late sixth millennium B.C. a slightly less arid climate set in, following a brief hyperarid episode abound 6000 B.C. These somewhat more favorable conditions lasted, with the exception of short hyperarid interruptions, until about 2400 B.C. During the first part of this period, the 'Neolithic Wet Phase,' some Epi-Palaeolithic hunters and collectors must have coexisted with new and expanding agricultural communities [in Egypt]."

On the basis of the climatic history outlined above, one might tentatively suggest that the Great Sphinx was built in very early dynastic times or late predynastic times (late fourth millennium or earliest third millennium B.C.). However, one must account for the considerable weathering *[and erosion]* that appears on the walls of the Sphinx hollow, on the body of the Great Sphinx itself, and on the walls of the Valley and Sphinx Temples (see below)—in the case of the Great Sphinx and its associated temples, weathering that was possibly covered up or repaired during the Old Kingdom (ca. 2600–2400 B.C.). One must also take the seismic data into account (see below). These latter considerations suggest the possibility that the initial carving of the Great Sphinx may be at least several millennia older than its standard attribution.

Two-Stage Construction of the Sphinx and Valley Temples

As far as can be determined, the core of the Sphinx Temple (and possibly the core of the Valley Temple) is constructed out of titanic limestone blocks taken directly from the ditch around the Sphinx (see the work of Aigner, 1982, 1983a, 1983b, 1983c, and Lehner, 1980, 1985a, 1985b, 1991, 1992a, 1992b, 1997). Therefore the limestone core of the Sphinx Temple (and also probably the Valley Temple) must be as old as the Great Sphinx itself. The limestone cores of these temples were later (perhaps thousands of years later; see discussion that follows) faced by the ancient Egyptians with ashlars (casing stones) made of Aswan granite (see Lehner, 1992b, who notes that the limestone cores of both temples were cased in granite at some point in their history). It also appears that the limestone cores of the temples, especially that of the Valley Temple, were perhaps partially rebuilt by the dynastic Egyptians. Based on my field observations, I believe that certain limestone blocks, as well as a few granite blocks, in the Valley Temple specifically do not originate from the Sphinx enclosure. *[Of course, none of the granite blocks originated from the Sphinx Enclosure; what I was referring to here is that a few of the limestone and granite blocks in the temples were either added or reworked later, after the main granite facing stones were applied.]* These blocks are probably not original to the temple, but constitute additional blocks that were introduced during dynastic rebuilding of the temple *[the same apparently holds true for the Sphinx Temple]*. Since Old Kingdom times virtually all of the granite has been removed from the Sphinx Temple and much of the exterior granite has disappeared from the Valley Temple; this robbery of the granite may have taken place primarily during New Kingdom times (circa 1400–1100 B.C.; Lehner, 1992b) and later.

Based on my field observations of the granite ashlars and the underlying limestone blocks, I believe that the limestone core blocks of both the Sphinx Temple and the Valley Temple were exposed to the elements and underwent considerable weathering and erosion before the granite was put into place. In places the backs of the granite facing blocks were cut in an irregular, undulating pattern so that they would complement or match the irregular weathering *[and erosion]* pattern on the limestone blocks that they were used to refurbish. In observing the Valley Temple in particular, one also notes that the limestone walls, where stripped of their granite, are not cut smoothly. Rather they have a higgledy-piggledy surface pattern where apparently the ancient Egyptians, before resurfacing the temple with Aswan granite, slightly cut back and smoothed out the weathered surface of the wall, but they did not take off enough weathered surface *[that is, weathered surface material]* to make the wall perfectly smooth. Perhaps the ancient Egyptians, in renewing the temples with granite, were also consciously preserving as much of the original limestone structures as possible. Conceivably the original limestone structures were, even then, considered to be very ancient and very sacred.

The general Egyptological community agrees that the granite facing on the Sphinx and Valley Temples is attributable to Khafre (see, for instance, Hawass, 1990, 1998). On site I found an inscription carved into the granite of the Valley Temple which according to John Anthony West (personal communication; see also Edwards, 1985; Grinsell, 1947; Hawass, 1990) appears, on stylistic grounds, to be an Old Kingdom inscription.

It seems a good assumption that the limestone core blocks would have been freshly cut (that is, unweathered) when initially used to construct the temples. Therefore if the granite facing is covering deeply weathered limestone, the original limestone structures must predate by a considerable degree the granite facing. Obviously, if the limestone cores (originating from the Sphinx ditch) of the temples predate the granite ashlars (granite facings), and the granite ashlars are attributable to Khafre of the Fourth Dynasty, then the Great Sphinx was built prior to the reign of Khafre. Note, however, that the attribution of the granite ashlars to the time of Khafre is itself circumstantial. As mentioned above, the ashlars bear Old Kingdom inscriptions and therefore must be at least as old as the Old Kingdom. But the Old Kingdom inscriptions could conceivably have been carved into still earlier structures.

Ancient Repair Campaigns to the Body of the Sphinx

The body of the Sphinx has been subjected to various repair campaigns, beginning with the ancient Egyptians themselves and continuing up to the present day. The earliest repairs to the body of the Sphinx have been carried out using what appear to be Old Kingdom style masonry techniques. Gauri and his colleagues (see for instance Punuru et al., 1990, p. 230) consistently refer to these in such terms as "Pharaonic veneer stones" that have experienced "5,000 yr of exposure to local conditions," that is, they were applied during Old Kingdom times. Likewise, Hawass (1992, p. 14) states that: "It seems that the Sphinx underwent restoration during the Old Kingdom because the analysis of samples found on the right rear leg proved to be of Old Kingdom date." If the oldest repairs to the eroded body of the Sphinx do date to Old Kingdom times, this is another strong argument in favor of a much earlier date for the Sphinx.

Lehner has analyzed the repair campaigns to the Sphinx (see Lehner, 1980; Hamblin, 1986), concluding that, despite his own evidence to the contrary, "To seek agreement with known historical facts [i.e., his contention, among other things, that the Sphinx was built in circa 2500 B.C. by Khafre], we should probably expect the earliest restoration to have been done in the New Kingdom [ca. 1500–1400 B.C.]" (Lehner, 1980, p. 18). In summary, in order to save the attribution of the Sphinx to Khafre (Chephren), circa 2500 B.C., Lehner suggests that the earliest level of "large-block" (Old Kingdom style?) masonry was added to the Sphinx during the New Kingdom. Taking not only Lehner's work into account, but also the evidence for the two-stage construction of the Sphinx and Valley Temples (discussed above), the research that has been carried out concerning different modes of weathering on the Giza Plateau (discussed above), and the seismic surveys in the area of the Sphinx which give data on the subsurface depth and distribution of weathering around the Sphinx (discussed below), and considering the fact that the attribution of the Sphinx to Khafre is based on circumstantial evidence to begin with (see Schoch with McNally, 1999, 2000), I find one conclusion inescapable—the initial construction (carving) of the core body of the Sphinx predated the time of Khafre. Lehner's own work is more easily reconciled with the hypothesis that the Fourth Dynasty Egyptians merely restored, refurbished, and added to the Sphinx and its associated structures, rather than being the original creators of the Sphinx complex.

Countering Lehner's contention that the earliest masonry was added to the Sphinx in New Kingdom times, Hawass (1993) has asserted that the Old Kingdom style masonry indeed dates to the Old Kingdom.

> Since the natural limestone was formed in geological ages, the Sphinx's body layers were, of course, already of poor quality in the Old Kingdom when the Egyptians carved the Sphinx. If there was a master plan for the Khafra complex that included the Sphinx, the Overseer of Works had no choice but to carve it in this location and to incorporate these weaker layers in the massive lion body. The workers first removed the mother rock in a V-shaped ditch, leaving a standing rock core which became the Sphinx.
>
> At the very base of the Sphinx, where we have gained a good look at the mother rock, there are extremely large limestone blocks, similar to those from Turah in their quality, that

> cover the bedrock and form a casing or coating over the Sphinx. Since the hard Member I mother rock does not weather, its rough surface underneath these large blocks must have been left as we see it by the original Sphinx builders. It was also in this condition when the casing of the very large blocks just mentioned was added. The conclusion follows that these large blocks belong to an Old Kingdom casing that was done by Khafra's workmen in order to complete the modelling of the lion body, since the poor quality limestone of Member II, higher up and comprising most of the core body, would not suffice for fine modelling. The Sphinx architect tried to complete the mother rock sculpture by adding stones, exactly as the builders did with the pyramids, mastabas, and temples of this time. (Hawass, 1993, p. 179)
>
> In other words the Old Kingdom master sculptor had carved the face, beard and neck only. The Overseer of Works and the Pyramid architect protected the weak rock with large stones of the same quality used to encase the pyramid. The sculptor added a finish to the casing of large stones rather than to the mother rock. The sculptor worked together with the architect in the gross modeling of the mother rock and the final modeling of the exterior form. This exterior final form of the Sphinx's body, modeled as a lion was completed with masonry. We have seen clearly these relationships between unfinished mother rock and finished Old Kingdom outer masonry during our restoration work on the tail, the sides and the chest of the Sphinx. (Hawass, 1993, p. 180)

There is one problem with this proposal by Hawass, that the core body of the Sphinx was crudely or roughly carved out by the Old Kingdom Egyptians, and then immediately covered with better quality limestone blocks that were finally finished to create the complete sculpture. If Hawass is correct, under the first layer of added masonry there should be some indications of artificial cutting and working of the bedrock, such as quarry marks or chisel marks. Lack of such evidence would suggest that a long period of time elapsed between the carving of the core body from the bedrock and the first layer of masonry added to the body—long enough to develop the deep and extensive weathering and erosion observed on the core-body of the Sphinx. Indeed, there is such a lack of evidence of preserved tool marks and so forth on the bedrock. As Lehner (1980, pp. 17–18) wrote:

> Except for the prominent boss on the chest [which, I (RMS) note could have been reworked during ancient restoration campaigns], we have nowhere observed any kind of working marks on the core-body, either in the way of tool marks or of surfaces that would seem to have been left by rough quarrying activity. Neither have we found any profile on the core that would appear to be of finished sculpture. This might easily be explained by saying that the part of the core-body now showing—almost entirely of the very soft Bed 2 stone—has been eroded so badly that all such traces have disappeared. Even so, in the cross-sections showing through the successive layers of masonry added to the core, one would expect such traces to show under the earliest level of stonework had it been added soon after the core was formed, thereafter protecting the profile of the parent rock. But on the face and profile of the core in such cases there are no observable indications of parts of a finished profile or of working marks. Rather, the profile of the core seems in all cases to be one of severe erosion, leaving the softer yellowish bands and harder intermediate strata showing a profile of successive rolls and undulations. These considerations would seem to indicate that the core-body of the Sphinx was already severely eroded when the earliest level of large-block masonry was added to it.

In my assessment, Hawass is correct in his determination that the oldest masonry, that is the oldest "restoration" or "repairs," applied to the core-body of the Great Sphinx dates to the Old Kingdom. This, in my opinion, further supports the contention that the statue was originally carved much earlier than Old Kingdom times. The "profile of successive rolls and undulations" noted by Lehner in the quotation above is indicative, in my assessment, of the earlier climatic regime that the original (prior to Old Kingdom times) core-body of the Great Sphinx was subject to.

Returning to the comments by Hawass, he states:

> These large stones are of the same quality as those used in making the causeway of Khafra. However, these large stones on the Sphinx were not taken by Thutmose IV from the Khafra causeway to restore the Sphinx as Lehner suggested. The surface of the mother rock was already completely covered with these stones in the Old Kingdom. Only the head and neck were completed in the mother rock and left without covering because the layers from which they were carved are stronger (Member III). This is indicated clearly in the much better preservation of the surfaces of the Sphinx's face and head as com pared with the major part of the lion body. (1993, p. 180)

Here I agree with Hawass to a certain extent. The Old Kingdom Egyptians covered the core-body of the Great Sphinx, but they were covering over and restoring an older statue. Their restoration work actually protected and preserved the very ancient (ancient in Old Kingdom times), heavily weathered and eroded core-body. Regarding the neck and head, they did not cover these over but instead re-carved the neck and head (what Hawass refers to as "completed in the mother rock and left without covering").

Hawass (1993, p. 180) also notes, "Our studies indicate that the Old Kingdom stones that were put on the Sphinx body were respected in later times, perhaps because they were held sacred by the later pharaonic restorers." Hawass suggests that during various New Kingdom restorations the ancient Egyptians did not primarily add stones and masonry to the body of the Great Sphinx, but rather their main objective was to put back in place, reset and refurbish, various Old Kingdom masonry that had fallen off. This he argues is the reason that one finds weathered and eroded surfaces under some of the Old Kingdom restoration blocks. However, it does not seem likely that the degree and nature of weathering and erosion consistently observed under all of the Old Kingdom style masonry blocks (as noted by Lehner; see quotation above) could be due to the blocks getting knocked off and exposing the bedrock to the elements during the period between a supposed initial carving during the Old Kingdom and the New Kingdom restorations. According to conventional Egyptological dating, only about a millennium separates Khafre [Khafra], who reputedly ordered the Sphinx carved (circa 2500 B.C.), and Thutmose IV, who restored the Sphinx during the New Kingdom (circa 1400 B.C.). Presumably the blocks would not have fallen off immediately after being positioned in place, and it is recorded that before the New Kingdom restorations, the body of the Great Sphinx was buried in sand, which in my assessment would served to protect it from the elements rather than weather and erode the rock.

Even during the Greco-Roman restorations, the Old Kingdom restorations were preserved.

> Between 30 B.C. and the 2nd century A.D., in the Roman Period, there was again a program to restore the Sphinx. Once again, the Roman Period restorers did not remove the Old Kingdom stones from the Sphinx's body. The layers of the Roman Period are composed of small brick-

> sized stones (Phase III) that were placed on top of the Old Kingdom stones and later casings. The Romans seemed to know in that period the importance of the older original stones. No other explanation can be given except, that they considered these stones sacred and divine. (Hawass, 1993, p. 180)

I suspect that the same reverence and respect was paid to the original, even if highly eroded, core-body of the Great Sphinx in Old Kingdom times when the first layer of restoration masonry was added; likewise the core blocks of the Sphinx and Valley Temples were held in reverence even as they were restored and faced with granite. Concerning the head, they may have initially attempted to preserve and restore a very ancient, highly weathered and eroded, face (perhaps the face of a lion), but found it impossible to do so and thus made the difficult decision to carve anew the head.

Seismic Surveys of the Sphinx Area

Seismic geophysical surveys (Dobecki, 1992; Dobecki and Schoch, 1992) indicate that the subsurface weathering in the Sphinx enclosure is not uniform. This strongly suggests that the entire Sphinx ditch was not excavated at one time. Furthermore, by estimating when the less weathered portion of the Sphinx enclosure was excavated and thus first exposed subaerially one can tentatively estimate when initial excavation of the Sphinx enclosure may have begun.

During our April 1991 trip to Egypt, Thomas L. Dobecki, Ph.D., a seismologist then with McBride-Ratcliff and Associates of Houston, Texas, helped us carry out some low-level *[low-energy]* seismic work in the vicinity of the Great Sphinx with the permission of the Egyptian Antiquities Organization. We were able to gather a quantity of seismic data, and with this data we have been able to establish subsurface geometries of the bedrock and have located several previously unknown features below the surface.

Nineteen refraction profiles, two reflection profiles, and a refraction tomography data set were collected on the Giza Plateau during April 1991. The seismic work performed around the base of the Sphinx consisted of hitting a sledgehammer on a steel plate, thus generating energy waves that entered the rock, traveled into the subsurface, and reflected and refracted off of subsurface features. In the Sphinx enclosure refraction profiles gave us information on the subsurface weathering of the rock. In addition, we located various voids, cavities, and other subsurface features (see Dobecki and Schoch, 1992).

Analysis of the seismic data collected in April of 1991 contributes further to exploring the age of the Great Sphinx. Seismic lines taken in front of and along the body of the Great Sphinx on either side (east [seismic line S4], north [seismic line S1], and south [seismic line S2] of the Sphinx) indicate that below the surface the limestone is weathered up to six to eight feet [1.8 to 2.5 meters] deep. However, along the back (west side [seismic line S3]) of the Great Sphinx the identical limestone has only been weathered to a depth of approximately four feet [1.2 m]. These results were completely unexpected. It is the same limestone that surrounds the Great Sphinx (the floor of the Sphinx enclosure where all of the seismic lines were taken consists of Gauri's [1984] Rosetau Member, or Member I), and if the entire body of the Great Sphinx was carved out of living rock at one time, it would be expected that the limestone surrounding it should show the same depth of subsurface weathering. One possible interpretation of the data we collected is that initially only the sides and front (eastern portion) of the body of the Great Sphinx were carved free from the rock, thus projecting from the rock outcropping, while what would later become the back or rump (western end) of the Sphinx originally merged with the natural rock. To be more precise, the rump was probably initially carved down only to the level of the upper terrace (about 11.5 feet [3.5 meters] above the present floor of the Sphinx enclosure at the rump), which to this day remains immediately west of the Sphinx within the general Sphinx enclosure; below the level of the terrace the back of the Sphinx merged with the bedrock. Hassan (1949) suggests that the Sphinx was originally meant to be viewed from the front (rather than from the sides or rear), such that, with the Sphinx Temple before it, the Sphinx seems to sit on a pedestal. Alternatively, the rump or western end of the Sphinx may have been originally freed from the rock, but separated from the bedrock by only a very narrow passage not sampled by our April 1991 seismic line. In order to determine accurately when the western end of the Great Sphinx was freed from the bedrock, and to establish a chronology of the possible widening of the passage between the western end of the Sphinx and the bedrock, more detailed work (including the collection of several more seismic profiles parallel to seismic line S3) will be necessary. However, it is already clear that the limestone floor behind the rump (western end) of the Sphinx which we sampled seismically in April 1991 was exposed later (i.e., probably in Khafre's time) than the east, north, and south limestone floors. Once the sides of the body and eastern end of the Sphinx were carved, the limestone floor surrounding it began to weather, but what was to become the limestone floor behind the western end of the Sphinx was still protected by a thick layer of solid rock.

A reasonable hypothesis is that when Khafre (ca. 2500 B.C.) repaired and refurbished the Great Sphinx, the Sphinx Temple, and the Valley Temple, he either had the back (western end) of the Great Sphinx carved out and freed from the cliff or widened an existing passage behind the western end. It is difficult to argue that the back (rump) of the Sphinx was carved out and freed any later than Khafre's time; the rump has, like the rest of the core body of the Sphinx, been weathered and repaired with limestone blocks of various ages, including blocks that date back to at least New Kingdom times (see various articles by Lehner and discussion above) so the rump must have been freed well before New Kingdom times in order to have required repairs during the New Kingdom. Furthermore, one must account for the non-trivial four feet (1.2 meters) of subsurface weathering detected behind the rump of the Sphinx. It seems unlikely that this amount of weathering could have occurred since New Kingdom times.

As an alternative to the scenario that Khafre had the back of the Sphinx carved free from the bedrock, one could suggest that if the back of the Sphinx was already freed from the bedrock prior to Khafre's time, but only separated from the cliff by a very narrow passage, Khafre may have widened this passage and uncovered the limestone floor that we sampled seismically. Our seismic line was positioned very close to the western wall of the Sphinx ditch. The Sphinx Temple also sits in a hollow carved out of bedrock just east of the Sphinx. Along the outside of the northern wall of the Sphinx Temple it appears that the bedrock face of the adjacent wall was cut-back so as to widen the passage between the temple wall and the carved limestone bedrock wall to the north, thus making room for the refurbishing of the wall with newer granite blocks. Possibly both of these areas, behind the rump of the Sphinx and north of the Sphinx Temple, were widened at the same time—presumably around the time of Khafre.

Once exposed, the limestone floor on the western end of the Sphinx *[enclosure]* began to weather. Assuming that the floor of the western end was first carved out around the time of Khafre, and given that there is 50% to 100% deeper weathering of the limestone floor on the sides and front of the Sphinx as compared to the floor in back of the Sphinx, we can estimate that the initial carving of the Great Sphinx (i.e., the carving of the main portion of the body and the front) may have been carried out circa 7000 to 5000 B.C. (that is the initial carving of the core body of the Sphinx is approximately 50 percent to 100 percent older than 2500 B.C.). It can be argued that this tentative estimate is a minimum date; given that weathering rates may proceed non-linearly (the deeper the weathering is, the slower it may progress due to the fact that it is "protected" by the overlying material), the possibility remains open that the initial carving of the Great Sphinx may be even earlier than 9,000 years ago (see further discussion below).

Admittedly, estimating the date of the initial carving of the Great Sphinx by discrepancies in the depth of subsurface weathering below the floor of the Sphinx enclosure is less accurate and precise than we might desire. However, in the absence of other data and tests (such as proposed measurements of cosmogenically-produced isotopes in the surface layer of the rock of the Sphinx), we must work with the evidence at hand. I have pondered long and hard the many complex factors that could enter into the rate of subsurface weathering around the base of the Sphinx. Weathering rates may vary over time. As the climate was generally moister at an earlier period (prior to the middle of the third millennium B.C.) this might suggest that weathering progressed faster and deeper at this earlier period around the north, east, and south sides of the Sphinx (before the western end was freed from the bedrock). However, the subsurface weathering seen around the base of the Sphinx would not necessarily be accelerated by a moister climate per se.

The subsurface weathering is probably primarily a function of alternating periods of moisture collecting on the surface of, and penetrating within, the rock followed by evaporation—this cycle might take place on a daily, seasonal, or longer time-scale. The effects of a rainy versus more arid climate may be fairly minimal in terms of this particular weathering phenomenon if the alternating cycle of moisture penetration and evaporation occurred on a regular basis (as it seems to at the present time within the Sphinx enclosure) under various climatic regimes. If the limestone floor of the Sphinx enclosure were completely covered with standing water that did not evaporate off, the standing water might serve more to protect the limestone than weather it (after all, the limestone was originally precipitated in water). In other words, the absolute frequency of the number of rain/evaporation cycles may be more important relative to the subsurface weathering than the absolute volume of rainfall. The Giza Plateau has had a mean annual rainfall of about one inch (2.5 cm) per year since Old Kingdom times. During the earlier temperate wet period (the time of pluvials) the frequency of rainfall was undoubtedly greater, but any collected water may not have evaporated as quickly and completely. Also, as noted already, depth of weathering does not typically proceed linearly if, as in the case of the floor of the Sphinx enclosure, the overlying weathering products (the weathered rock) are not removed. As weathering depth increases, the rate of weathering decreases due to the protection afforded by the overlying material. Thus even if we postulate that the base of the original Sphinx structure initially weathered a bit more quickly due to moister climatic conditions prior to five thousand years ago, this initially faster rate of weathering would quickly decelerate as weathering depth increased.

Taking the various factors that could affect the rate of subsurface weathering around the base of the Sphinx into account, as a first approximation I have simply assumed that the factors that would tend to accelerate the rate and depth of weathering are canceled by the factors that would tend to slow the rate and depth of weathering. On this basis I have used a linear extrapolation to estimate that the initial carving of the core body of the Great Sphinx occurred during the period of approximately 7000 to 5000 B.C. I believe that the estimate of 7000 to 5000 B.C. for the initial carving of the Sphinx is crude, but consistent and compatible with all of the other evidence at hand. *[See chapter 2 for my latest thoughts on this topic.]*

It should also be noted that we ran a north-south seismic line [line S9] through the Sphinx Temple east of the Great Sphinx (Dobecki and Schoch, 1992). This line also shows a weathered layer above a sound limestone layer, with a uniform depth of weathering of about four to five feet [1.2 to 1.5 meters]. Given the contention that the Sphinx Temple was constructed at the same time as the carving of the Great Sphinx, this depth of weathering under the floor of the Sphinx Temple may be considered abnormally shallow. However, there is evidence that the current surface of the floor of the Sphinx Temple is lower than the original surface. Pillars inside the Sphinx Temple stand on rock pedestals—it seems evident that the floor was lowered around them. It appears probable that the original, weathered floor of the Sphinx

Temple was lowered and resurfaced during Old Kingdom restorations and refurbishing to the Sphinx Temple.

In addition to the unanticipated differential weathering around the body of the Great Sphinx, our seismic work also revealed several other interesting subsurface features. For example, there is clear evidence of a possible void or chamber under the left paw of the Sphinx (Dobecki and Schoch, 1992). The seismic profiles indicate that the Great Sphinx and Sphinx Temple sit on a steep cliff (now buried in sand [seismic line S10]), and beyond this cliff are several elusive downdrop structures in the bedrock surface; these features may be either natural or man-made. In all, nineteen seismic profiles (seventeen collecting refraction data, and two collecting both refraction and reflection data) were taken. The geophysical data collected during the April 1991 trip to Egypt is described in more detail in Dobecki and Schoch (1992).

Arguments against the Geological Data Supporting an Older Sphinx

Recently the authors Lawton and Ogilvie-Herald have summarized the major arguments against an older Great Sphinx in their book *Giza: The Truth* (1999). Here I will summarize and comment on some of the arguments they discuss.

Lawton and Ogilvie-Herald (page 313) agree with me that the current arid climatic regime of the Giza Plateau began approximately in the middle of the third millennium B.C. (ca. 2350 B.C. by one standard dating scheme) and there were various periods of relatively heavy rainfall from about 10,000 or 8000 B.C. up until the onset of the predominant aridity that has existed in the area for the last 4,500 years or so. Lawton and Ogilvie-Herald also correctly point out that there were occasional rains, even heavy rains, during dynastic Egyptian times and up through the present day, resulting in periodic flash floods. Still, as will be discussed further below, such flash floods actually have little bearing on the weathering, erosion, and ultimately the determination of the age of the oldest portion of the Sphinx (here it is important to remember that the Great Sphinx was refurbished and partially recarved, including a recarving of the head, in dynastic times—originally it may not have even looked like a Sphinx; see Schoch with McNally, 1999, 2000; West, 1992).

Sporadic heavy rains and the resulting flash floods (due to the inability of the rain to penetrate and soak into the land's surface and thus it runs off and collects in valleys, wadis, and other depressions) commonly found in arid regions do have tremendous potential to move loose debris and even cause serious erosion. However, in my opinion as a geologist, the nature and especially degree of weathering seen in the Sphinx enclosure and on the body of the Sphinx itself, is incompatible with sporadic flash floods since dynastic times. Even if occasional heavy rains occur on the Giza Plateau, the fact remains that currently on average only about an inch of rain each year occurs in the region (25 to 29 mm annually).

I do not believe that there has been enough rainfall in the area over the last 5,000 years to account for the tremendous degradation of the actual limestone bedrock as seen on the western end of the Sphinx enclosure, much less to account for the extreme weathering and erosion seen on the core body of the Sphinx itself. The latter is an important point, because in the case of the body of the Sphinx only the back (top) of the Sphinx serves as a catchment area for any subsequent runoff. From what we understand of the climate of the area, it strains credulity to suggest that this weathering and erosion is the result of rainfall during the last 4,500 years. This is even more so the case when we take into account the calculations of Lawton and Ogilvie-Herald (page 312) that the Sphinx enclosure and body of the Sphinx have been buried in sand, and thus effectively protected from this type of erosion, for 3,100 of the last 4,500 years.

Furthermore, based on the perceptive analysis of the geologist Colin Reader (1998; discussed below *[see also Reader, 2001, 2002, 2006a, 2006b]*), since at least the time of Khufu (ca. 2550 B.C. according to one standard chronology), the Sphinx has not even been situated in a position where it could receive the brunt of such flash floods. Among ancient Egyptian structures, those that show clear signs of having been damaged or otherwise significantly affected by the occasional heavy rains and resulting flash floods are those situated in valleys, wadis, and other low areas that serve as channels for the collected water. Lawton and Ogilvie-Herald cite the Valley of the Kings at Luxor as a case in point, and other authors have cited *[George]* Reisner's suggestions of flood damage to the Menkaure *[also written Menkaura, or Mycerinus; this was the pharaoh who reputedly is associated with the Third Pyramid at Giza]* valley temple on the Giza Plateau *[(see Reisner, 1931, and Reader, 2002, 2006a)]*. Potential flood damage to Menkaure's valley temple is very different in kind and degree than the actual erosion and degradation of limestone bedrock as seen in the Sphinx enclosure. According to Lehner (1997, 137), Menkaure's valley temple "lies at the mouth of the main wadi" (as is clear from maps of the site, as well as personal inspection of the area) which would situate it to receive the brunt of any ephemeral flash floods and hardly is relevant to the western end of the Sphinx enclosure or the body of the Sphinx itself. Furthermore, it was apparently finished in mudbrick by Shepseskaf, then rebuilt (after being "flooded" at some point) during the Sixth Dynasty. To use an argument from Menkaure's valley temple or the Valley of the Kings at Luxor in an attempt to keep some semblance of the traditional date for the Sphinx, or at least keep it dynastic, just doesn't work.

Lawton and Ogilvie-Herald proceed (starting on page 315) to discuss a number of "types of weathering" that they claim are taking place in the Sphinx enclosure, but it quickly becomes evident that they have little understanding of the topic. They discuss what they term "precipitation weathering" (caused by rainfall, as I have elucidated in my various works), "wind-sand weathering" (also based on my work), and "chemical weathering" (apparently based primarily on the papers of Gauri [see above] and Harrell, 1994, 2000). They divide the latter category into "capillary weathering" (apparently based on ideas from both Gauri and Harrell), "wet-sand weathering" (based primarily on the ideas of Harrell), and "atmospheric weathering" (apparently based on the work of both Gauri and Harrell).

Rather than addressing Gauri and Harrell indirectly via a discussion of Lawton and Ogilvie-Herald's reinterpretation of their ideas, here I will briefly discuss Gauri and Harrell directly.

K. Lal Gauri has maintained that the weathering and erosion of the Sphinx and walls of the Sphinx enclosure are the result of the various effects of chemical weathering, particularly something known as "exfoliation" or the flaking away of the surface of the limestone. According to Gauri, dew that forms at night on the surface of the rock dissolves soluble salts found on the surface and then the liquid solution is drawn into tiny pores in the rock by capillary action. During the daytime the solution evaporates and salt crystals precipitate in the pores. As the crystals form they exert pressure which causes the surface of the limestone to flake away. This, in fact, is an important weathering factor that is currently taking place on the Giza Plateau. However, it alone cannot account for all of the weathering features seen in the Sphinx enclosure, and more importantly it alone cannot account for the specific distribution of weathering features actually found in the Sphinx enclosure (such as the more intense weathering, erosion, and degradation seen in the western end of the Sphinx enclosure, as discussed further below).

The weathering processes proposed by Gauri will also have their maximum effect under extreme arid conditions with the Sphinx exposed to the elements. When buried under a layer of sand, the Sphinx and Sphinx enclosure are on the whole protected from these effects. Also, interestingly, the flaking away of the rock as proposed by Gauri is (or at least should be) operating on all of the limestone surfaces of the Giza Plateau, yet somehow virtually no other surfaces show the same type of weathering and erosional profile as seen in the Sphinx enclosure. While I do not deny that salt crystal growth is indeed damaging the Sphinx and other structures during the present day, this mechanism does not explain the ancient degradation patterns observed on the Sphinx's body and in the Sphinx enclosure area but virtually nowhere else on the Giza Plateau.

Gauri has also suggested that the Sphinx and Sphinx enclosure have been, and are, subject to extremely rapid weathering, and he has pointed out that there has been significant deterioration of the Sphinx since the beginning of the twentieth century. As I have pointed out previously, however, and in all fairness Lawton and Ogilvie-Herald mention this in their book, one cannot extrapolate present modern weathering rates back into the past when it comes to the Giza Plateau. Industrialization, air pollution, acid rain, rising water tables due to encroaching settlement, tourism, automobile and bus traffic, and so forth, may (I believe are) affecting *[affect]* the structures on the Giza Plateau in a detrimental manner. Modern weathering and erosional processes are not the same as the ancient processes in every case.

As I have discussed previously in a letter to the magazine *Archaeology* (Schoch, 1995a), much of the Hawass-Lehner argument (Hawass and Lehner, 1994; see also Hawass, 1998, and Lehner, 1980, 1985a, 1985b, 1991, 1992a, 1992b, 1997), which is in large part based on the work of Gauri, for a younger Sphinx hinges on the assertion that its present style and rate of weathering and erosion is representative of its past weathering. Hawass and Lehner (1994) have stated that "ancient and modern weathering on the Sphinx are, for the most part, the same ball game." They discuss how soft the limestone is in some places ("you can crumble the stone with your fingertips") and the flaking of the stone to produce "giant potato chips" without realizing that these surficial weathering features are primarily due to modern assaults (pollution, acid deposition, salt deposited by rising water tables from the adjacent village and the damming of the Nile, and so forth) that have not been operating over the last five millennia. The work of K. Lal Gauri has documented the modern deterioration, as opposed to ancient weathering, of the Sphinx. In one publication Gauri illustrates, using comparative photographs from circa 1925–26 and circa 1980–81, how amazingly rapid this deterioration has been over the span of just a few decades (Gauri and Holdren, 1981). This contradicts the Hawass-Lehner assertion that the ancient and modern weathering are the same. Arguably the Sphinx has suffered more during the last century than it did during the previous 5,000 years.

It has also been suggested that the Sphinx has been heavily weathered by the action of subsurface ground water being sucked up into the pores of the rock by capillary action (Lawton and Ogilvie-Herald, page 316). There are a couple of problems with this hypothesis. First, I have yet to see any evidence that this is actually occurring to any significant extent today, much less in the past. If it is a significant factor in producing the weathering profile seen on the Sphinx and in the Sphinx enclosure, then it should also produce the same features (and to the same degree) on rock-cut structures carved from the same limestones and at the same elevation or lower found immediately to the south of the Sphinx enclosure. Yet such "capillary weathering" is not evident there. Second, such "capillary weathering," if it does indeed occur to any significant degree in the present day, may well be the result of rising water tables due to sewerage from the adjacent village that has been progressively encroaching on the Giza Plateau.

James Harrell is the major proponent of the "wet-sand" theory to explain the weathering and erosion of the Sphinx and Sphinx enclosure (Harrell, 1994). He has suggested that sand piled up for centuries in the Sphinx enclosure has been wetted by rainfall, Nile floods, and capillary action sucking water up into the overlying sand. Persistent flooding, however, would be expected to cut a wave bench into the Sphinx and the enclosure, and there is no such feature. Also, wet sand around the bottom of the Sphinx enclosure does not explain the obvious and pronounced weathering on the upper portions of the walls of the enclosure. Indeed, the major problem with the wet-sand hypothesis is that there is no documented mechanism known by which wet sand piled against a limestone surface will produce the weathering and erosional profile seen on the body of the Sphinx and on the walls of the Sphinx enclosure. Sand, even wet sand (if it ever occurred in the Sphinx enclosure—there is no evidence that it did to any significant degree), may actually have served more to promote the preservation of the Sphinx. Furthermore, capillary action, far from being a mechanism capable of keeping numerous feet of piled sand wet over many centuries, is negligible in loose sands in arid areas. Harrell's "wet-sand" theory simply does not work as an explanation for the weathering and erosional features of the Sphinx and Sphinx enclosure.

Lawton and Ogilvie-Herald (page 320) write "Schoch has emphasized that the enclosure walls are generally more eroded at the top than at the bottom, which appears at odds with the fact that the upper layers tend to be harder. However, Lehner argues that even the relatively uneroded eastern end of the south wall shows that it was deliberately cut with a slope in the original excavation of the enclosure." Thus, Lawton and Ogilvie-Herald imply that my observations are invalidated. However, as I already pointed out in the 1995 letter to *Archaeology,* I have never implied that the walls of the Sphinx enclosure were originally absolutely vertical. In a published illustration (in J. A. West, 1993a, p. 227) I show them at an approximately 80 degree angle before being weathered. However, the fact remains that even taking such a small slope into account the harder layers at the top of the section have been in general eroded back further than softer layers lower in the section, thus corroborating the hypothesis of an older Sphinx.

On page 320 of their book, as if to put the final "nail" in the coffin of an older Sphinx, Lawton and Ogilvie-Herald write: "Finally, West and Schoch have increasingly fallen back on the evidence of the deep, rounded, vertical hollows in the west and south walls of the Sphinx enclosure, insisting that these are *too* ["too" is stressed by being placed in italics by L and O-H] obviously weathered by precipitation for the other arguments about weathering to matter. We have sympathy for this view, but again Gauri appears to have an answer. He suggests that they represent faults in the rock originating from the time when the structural deformation of the whole Plateau caused the rock strata to tilt, perhaps millions of years ago, and that they were widened into cavities or channels by the 'hydraulic circulation of the underground water.' They were then exposed when the bedrock was excavated from the Sphinx enclosure." Again, as I pointed out in the 1995 letter to *Archaeology,* the limestones of the Giza Plateau are criss-crossed with fractures or joints, and these joints date back millions of years, and possibly some of them may be due to geologic faulting (but see comments by Coxill, 1998, quoted below). However, the joints are not opened up as fissures everywhere on the Giza Plateau. Vertical fissures such as those on the Sphinx enclosure wall can only be produced by water, primarily precipitation, and do bear on the age of the Sphinx. Basically the precipitation runoff follows paths of least resistance and thus works its way into weak joints and fractures. This is dramatically illustrated on the western wall of the Sphinx enclosure and the western portion of the southern wall (which have been subjected to substantial runoff) versus the eastern portion of the southern wall of the enclosure where the fissures are much less extreme; the eastern portion of the enclosure has not taken the brunt of the runoff. My critics, including Gauri, Lehner, Hawass, Lawton, and Ogilvie-Herald, do not distinguish between naturally occurring joints, on the one hand, and open fissures *[which may follow joints]* developed only through weathering processes on the other hand.

Regarding these so-called "faults," the geologist David Coxill (1998, 14 *[comments in brackets of the Coxill quotations below are by R. Schoch]*) notes:

> The sub-vertical joints . . . are a distinctive characteristic of the surrounding pit [that is, the Sphinx enclosure], and to a somewhat lesser extent, of the Sphinx itself. They are natural fissures in the rock, that were formed by contraction of the carbonate rich sediments, when they were undergoing rockification. These are sedimentologically related fissures and not tectonic

> faults related to earthquakes, since they do not displace the strata. On the . . . Causeway edge, they are sometimes closed and grouted by fine grained carbonate sediments [a natural process], while others, are open at the top, narrowing, and eventually closing—further down the vertical profile of the excavated pit face, and the sphinx's body. . . . They represent lines of weakness that have selectively and progressively been exploited by the forces of weathering.

It is worth quoting Coxill (pages 16–17), an independent geologist who has taken the time to study the Sphinx first-hand, further on these issues:

> [Robert Schoch] presented his findings . . . that the weathering features present [on the body of the Sphinx and in the Sphinx enclosure] are caused by rainfall that has cascaded over the sides of the monument and the surrounding pit. . . .
>
> Other theories have been put forward to try to counter the claim. Lal Gauri et al. (1995) consider that being porous, Member 2 limestone [of which the body of the Sphinx is carved], will suffer from morning dew condensation that dissolves salts within the limestone. When the heat of the day evaporates the water, the salts crystallise out and progressively exert minute pressure weakening the rock and opening up fissures already present. Both they, Hawass and Lehner (1994), suggest that sub-surface water movements, during Eocene times, caused the fissures to open as the water table dropped. This is intriguing, but unlikely to be the case.
>
> First, condensation affects all monuments in the Giza complex, but very rarely do any show the same type of weathering features of the Sphinx, surrounding pit and cut stone blocks of the Valley Temple.
>
> Second, these weathering features require intense weathering to form their present profile, and, condensation/evaporation is a relatively mild and insignificant form of mechanical weathering in this arid climate.
>
> Third, fluctuations in the water table do not lead to fissures being produced wider at the top.
>
> Lal Gauri [et al.] (1995) also suggest that the roundness of the laminars is due to gradational differences in the hardness of the strata. This does not account for variations in the weathering profile, within Member 2 beds, as previously discussed on the Sphinx's body or the presence of open fissures.
>
> Harrell (1994) suggests that wet sands from Nile floodwaters, and occasional rainfall, would have produced wet sands, leading to these weathering features. That is not acceptable, since floodwaters would have produced a wave cut bench and notch, which would certainly be seen today in the surrounding excavation pit. This is not the case, and again this theory does not satisfactorily explain the presence of erosion features higher up the Sphinx's body and pit face. . . . Therefore, by a process of elimination, it appears that floodwaters and fluctuating ground water levels cannot explain these weathering features, but rainfall does.

Bottom line: Coxill, an independent geologist (as of this writing, I have never met him nor corresponded with him *[as of late 2016, I have never met or corresponded with Coxill]*), corroborates my analysis of the nature and agency responsible for the predominant weathering and erosion seen in the Sphinx enclosure and on the body of the Sphinx.

Ian Lawton and Chris Ogilvie-Herald (pp. 324–327) have also criticized my analysis of the seismic data. Unfortunately, they make a number of incorrect assumptions and perpetuate misunderstandings. For instance, Lawton and Ogilvie-Herald (pp. 324–325) claim that I assumed that “the subsurface weathering has been caused by rainfall seeping down through the bedrock floor of the enclosure” when in fact I never postulated that to be the case at all. They then further argue incorrectly that when the Sphinx enclosure is filled with sand, as it has been for much of its existence, the sand will protect the underlying bedrock floor from subsurface weathering. Lawton and Ogilvie-Herald fail to understand the nature of subsurface weathering. Subsurface weathering is essentially a mineralogical and petrological change in the rocks that proceeds once the rock surface is exposed to the air or atmosphere (such as occurred when the core body of the Sphinx was excavated), no matter what the climate is like *[different climatic regimes may influence the nature and rate of weathering, however]*. Loose porous sand piled up in the Sphinx enclosure will not significantly protect the bedrock from this type of weathering *[although a tight-fitting, perhaps even cemented or mortared flooring, such as may have been installed at one point in the Sphinx Temple, might afford protection from such subsurface weathering, at least to some degree]*. This type of weathering is certainly not caused primarily by rainfall collecting on the rock surface and seeping down. It could even be argued that in some cases a moister climate with periods of standing water on the rock that protects the surface from atmospheric exposure may actually result in a slower rate of this form of subsurface weathering than may occur under dryer conditions. *[It can also be suggested that if indeed sand in the Sphinx enclosure helped protect the subsurface bedrock from weathering, as Lawton and Ogilvie-Herald asserted, then the substantial subsurface weathering detected below the surface would be indicative of an extremely old original structure—thus countering their belief that the Sphinx dates to Old Kingdom times.]*

To further dismiss the seismic data, Lawton and Ogilvie-Herald go on to claim (page 325) that “it is almost certain that the subsurface erosion has been caused far more by hydraulic and capillary action over the many millennia since the bed was laid down than by relatively recent rainfall and exposure.” They are simply wrong. It is subsurface weathering, not erosion (erosion is where the rock is actually carried away), that is under consideration here, and postulating unknown and undocumented mechanisms of “hydraulic and capillary action” as a way to explain the data is essentially meaningless. Furthermore, their explanation of hydraulic and capillary action, quoted above, does not address the discrepancies in subsurface weathering seen within the Sphinx enclosure.

Concerning the use of the seismic data to date the initial excavation of the Sphinx: It has taken about 4,500 years for the subsurface weathering at the younger, western-most floor of the Sphinx enclosure to reach a depth of about four feet (assuming that the western end was fully excavated to approximately its present state during Old Kingdom activity at the site). Since the weathering on the other three sides is between 50 and 100 percent deeper, it is reasonable to assume that this excavation is 50 to 100 percent older than the western end. If we accept Khafre’s reign as the date for the western enclosure, then this calculation pushes the date for the Great Sphinx’s original construction back to approximately the 5000 to 7000 B.C. range.

I believe this estimate nicely ties in with the climatic history of the Giza Plateau and correlates with the nature and degree of the surface weathering and erosion features. This estimate can be considered a minimum if we assume that weathering rates proceed non-linearly (the deeper the weathering is, the slower it may progress due to the fact that it is “protected” by the overlying material), and there is the possibility that the very earliest portion of the Sphinx dates back to before 7000 B.C. However, given the known moister conditions on the Giza Plateau prior to the middle third millennium B.C. versus the prevailing aridity since then, some might argue that initial subsurface weathering may possibly (but not necessarily) have been faster than later weathering, and this could counter balance the potential "non-linear" effect mentioned in the last sentence. In other words, the early moist conditions might, crudely, give deeper weathering which could appear to give it an "older" date but this is countered by the non-linear nature of the weathering which could appear to give it a "younger" date. In the end, based on many hours of analysis and rumination, I am satisfied that the two opposing factors roughly cancel each other out and a crude linear interpretation of the data is justifiable. In this manner, I return to my estimate of circa 5000 to 7000 B.C. for the oldest portion of the Sphinx, a date that is corroborated by the correlation between the nature of the weathering in the Sphinx enclosure and the paleoclimatic history of the region. *[See chapter 2 for my latest thoughts on this topic.]*

Lawton and Ogilvie-Herald (page 326) state that "Schoch himself accepts the existence of New Kingdom repair blocks on the *rump* ['rump' is stressed by being placed in italics by L and O-H] of the monument, indicating that extensive weathering had taken place at the back since the orthodox carving date. So why could this rate of weathering not have applied all over?" This is a dishonest statement. From my original 1992 *KMT* article *[appendix 6]* to my 1999 book *Voices of the Rocks* I have pointed out the disagreement among Egyptologists (such as Lehner and Hawass) as to whether the earliest repairs to the Sphinx date to the Old Kingdom or New Kingdom. I have never definitively "accepted" any particular date for them, although I tend to suspect that Hawass is correct and they are indeed Old Kingdom. Furthermore, I've made no statement nor judgement concerning the age of any repairs on the very western-most end of the core body of the Sphinx in the vicinity of where we ran our seismic line. Indeed, this area is currently covered at ground level with twentieth-century repair blocks that obscure any ancient repairs, and furthermore, evidence of New Kingdom repairs there (if they existed) would not invalidate the concept of an older Sphinx. It is well known that the Sphinx has been refurbished and reworked many times over the centuries. New Kingdom repairs could easily have replaced Old Kingdom repairs, and of course not all repairs from all time periods cover or repair equal amounts of damage as Lawton and Ogilvie-Herald imply in the quote above.

[Here I want to point out that if, hypothetically, the rump of the Great Sphinx was first carved down to the current level in New Kingdom times, cira 1400 BCE (3,400 years ago), then the 50 percent to 100 percent deeper subsurface weathering on the other three sides would, at a minimum, give a date of 50 percent to 100 percent older. That is, the original portions would date minimally to between 5,100 years ago (3100 BCE) to 6,800 years ago (4800 BCE); these dates are still considerably older than the conventional date of 2500 BCE for the Great Sphinx. But I must stress that, in my opinion, the depth of subsurface weathering at the western end of the Sphinx enclosure is not compatible with a New Kingdom date, whereas it is compatible with an Old Kingdom (or possibly even older) date.]

Lawton and Ogilvie-Herald go on to state (page 326) that "it is clear that the west wall [of the Sphinx enclosure] behind the rump [of the Sphinx]—which according to Schoch's theory must have been carved only circa 2500 BCE—*shows exactly the same vertical and rounded profiles as the* [presumably older] *south wall*. ['shows . . . south wall' is stressed by being placed in italics by L and O-H]" They therefore conclude that this obvious contradiction refutes my analysis. Actually it does nothing of the kind. Lawton and Ogilvie-Herald fail to mention that two "back walls" lie behind the rump of the Sphinx. The higher "back wall," which lies farther to the west, does indeed show rain weathering ("vertical and rounded profiles") and dates back to pre-Old Kingdom times. The seismic studies indicate that the lower "back wall," set directly behind the rump of the Sphinx and lacking the "vertical and rounded profiles," may have been excavated much later, possibly in Khafre's time (ca. 2500 BCE), when I believe the rump of the Sphinx was reworked and possibly at that time carved down to the same level as the floor of the Sphinx enclosure on the other three sides of the sculpture. I discuss this issue explicitly in my 1992 *KMT* paper titled “Redating the Great Sphinx of Giza” (see especially page 57 *[the entire article is reprinted as appendix 6]*).

These same authors argue against the two-stage construction of the so-called Valley and Sphinx temples, pointing out that some granite blocks have actually been worked into the Valley Temple and underlie an uppermost course of limestone blocks (page 331). Likewise, Old Kingdom pottery fragments have been found around and under detached limestone blocks of the Sphinx Temple (page 334). This evidence they take to “prove” that the temples, and therefore the Sphinx itself, must date to Khafre’s time. However, it is perfectly conceivable, in fact to be expected, that Old Kingdom artifacts would be found around the temples and newer (that is, Old Kingdom) granite blocks would be incorporated into the actual temples during the rebuilding and refurbishing phase of Khafre’s time. Clearly, there was much activity on the Giza Plateau during the Fourth Dynasty, and we should expect to find the remains of that activity.

Harrell has published various comments on the Internet concerning the geological evidence for the age of the Sphinx (Harrell, 2000). When I first read the latest comments by James Harrell, I immediately said to myself “here we go again.” Essentially, he is recycling some of the same tired arguments and misunderstandings, which have already been discussed and falsified in the literature, while adding further to the misconceptions.

In his opening paragraph Harrell claims that geologist Colin Reader “with slight modification” supports the dating of the Great Sphinx to the Fourth Dynasty, when in fact according to Reader the “excavation of the Sphinx” should be “tentatively placed sometime in the latter half of the Early Dynastic Period” or, in other words, in the Second or Third Dynasty (Reader, 1998; see further discussion of Reader’s paper below). Yes, Harrell later clarifies that Reader does not exactly agree with Harrell’s date, but the way he first presents Reader as *[potentially]* agreeing with a Khafre and Fourth Dynasty date is inherently deceptive. That “slight modification” of Reader’s dating makes all the difference in the world. I may not fully agree with Reader’s conclusions as to the absolute dating of the earliest portions of the Sphinx, but I do believe that Reader’s meticulous study (Harrell’s off-hand and anecdotal comments should not be allowed to detract from the importance of Reader’s careful study) clearly establishes that the origins of the Great Sphinx are pre-Khufu. *[Khufu is the reputed builder of the Great Pyramid, a pharaoh who reigned prior to Khafre.]* In fact, that is the crux of the debate over the age of the Great Sphinx as far as I am concerned. Is it Old Kingdom (i.e., Khufu-Khafre times) or earlier? A secondary question is: If it is pre-Old Kingdom, how much older is it? In my opinion, Reader *[corroborating my own work]* has established that the Great Sphinx is pre-Old Kingdom, so now the focus should turn to the question of how much older than Old Kingdom.

Harrell asserts that I have dated the Great Sphinx to 7000+ B.C., when in fact, even though I do not absolutely rule out such an early date, I have stated on numerous occasions that I believe the geological evidence is quite compatible with a date of 5000 to 7000 B.C. However, I am not adamant about these dates whatsoever. For me, the important issue is whether or not the Sphinx is pre-Old Kingdom. I would note here, though, that my dating of 5000 to 7000 B.C. is partially based on an analysis of the seismic work that was carried out on the Giza Plateau with Thomas Dobecki (see comments above *[see also discussion in chapter 2]*).

Contra Harrell, the low-velocity layer found under the floor of the Sphinx enclosure does not follow the bedding of the strata. The strike and dip of the limestone layers, as well as their composition, are clearly visible by observing the sides of the Sphinx enclosure. The differential weathering pattern that we recorded in the subsurface cuts across the dip of the strata and parallels the floor of the enclosure (as is to be expected of weathering). Furthermore, the dramatically shallower depth of the low-velocity layer immediately behind the rump of the Sphinx is totally incompatible with the notion that the seismic data simply records original bedding in the limestone. It is consistent, however, with the reconstructed scenario of the excavation of the Sphinx in stages that I have proposed. I am not simply mistaking a "shoal-reef facies" for a subsurface weathered zone and a "nummulite bank" limestone facies for unweathered subsurface limestone, as Harrell suggests.

Harrell asks how I know that the low-velocity layer seen under the floor of the Sphinx enclosure represents weathered limestone. He then goes on to state that "Nowhere has he [Schoch] ever given any evidence to support this claim. He has not dug or drilled into this layer and so has no idea of what is really down there." Actually, this is not quite true (although I would add that, by the same token, Harrell "has no idea of what is really down there"). First, one can obviously observe the rock currently exposed on the surface of the floor of the Sphinx enclosure, and it is weathered limestone (and it should be, even according to Harrell's bogus "wet sand" hypothesis discussed further below). It is very strange to argue that the observed surface is weathered, yet the subsurface is unweathered, despite no differences in seismic velocities; this just does not make sense. I fail to understand Harrell's convoluted reasoning. Second, if Harrell had ever read the *Geoarchaeology* paper that Dobecki and I published (cited above), he would have noticed that several short seismic lines (lines S5, S6, S7, and S8) were run just north of the Great Sphinx on the terrace area in order to acquire velocities on undoubted disintegrated remains of the Setepet Member (the limestones of which much of the body of the Sphinx is composed) and the weathered Rosetau Member (which forms the lowest-most portions of the Sphinx and the floor of the Sphinx enclosure). In this area one can acquire both seismic data and look at the layers in cross-section (since the rock has been exposed as a nice vertical profile along the northern wall of the Sphinx enclosure). The Rosetau Member is weathered and we recorded velocities compatible with a weathered layer on the terrace. Similar velocities were recorded in the Rosetau Member under the floor of the Sphinx enclosure. The most parsimonious explanation is that the low-velocity layer represents a weathered zone, rather than hypothesize that it is following "original bedding" when the evidence is actually counter to such an interpretation. I stand by our analysis of the seismic data.

Concerning the surficial weathering and erosion observed on the body of the Sphinx and on the walls of the Sphinx enclosure, this has been discussed at length in many other places (see especially Reader, 1998). Harrell's "wet sand" hypothesis has no basis in reality, and in my opinion does not merit further discussion at the moment (see comments above). As far as I can determine, the "wet sand" hypothesis was invented simply to explain away the degradation features seen in the Sphinx enclosure. There is no evidence that either there was wet sand in the Sphinx enclosure for long periods of time or that such wet sand would cause the degradation patterns actually observed. Let it be said here that if there was any truth to Harrell's "wet sand" hypothesis or similar ad hoc hypotheses formulated to simply explain-away the surface weathering and erosional features observed on the Sphinx and in the Sphinx enclosure, then similar weathering and erosional features (similar in both nature and degree) should be observed on and in numerous Old Kingdom shaft tombs and other structures found on the Giza Plateau, but they are absent.

Harrell invokes climatic records from the past century to demonstrate that the Giza Plateau is rained upon periodically. Of course it is; that is hardly the issue. He also, less convincingly, argues that a sand-filled enclosure that is rained upon will remain wet for "many weeks or months due to capillary retention." Actually, this is quite questionable (I don't believe there is any evidence to support Harrell's scenario along these lines), but in many ways it is beside the point. The real issue is whether wet sand piled against the limestone face will result in the degradation features and their distribution as actually observed in the Sphinx enclosure. I contend that the answer is no. Possibly wet sand against the limestone surface might result in some weathering of the rock, but it is uncertain to what degree. More importantly, wet sand piled against the limestone surface would probably protect the surface and impede the erosion of the rock (the actual carrying away of material), yet it is this pronounced erosion that is so prominent and important in the analysis of the degradation features seen in the Sphinx enclosure. Harrell's "wet sand" hypothesis cannot account for these features.

What can account for these features is surface rainfall runoff in pre-Khufu times, as so well elucidated by Reader's analysis (1998; see below). Harrell attempts to counter Reader's analysis by claiming, based on admittedly anecdotal evidence, that rainfall runoff still reaches the Sphinx enclosure and thus the degradation features observed today could have formed, according to Harrell, over the last 4,500 years. This, however, is despite the fact that Harrell states that he thinks "it is now universally agreed that the Sphinx spent most of its 4,500 year history buried in sand . . ." *[being buried in sand would help protect the Sphinx and the enclosure from erosion due to runoff]* and, as discussed above, it is not at all evident that the observed degradation features would even form when the Sphinx enclosure is filled with sand.

More importantly, however, is the fact that Harrell has no real handle on how much surface runoff there is now, or was in the past, or how it might actually degrade the limestones. His whole scenario is based on one anecdotal observation of a "torrent of water cascading into the enclosure during a rain storm" one night in 1990 or 1991. Exactly how much water (this might be difficult to observe at night during a sound-and-light show), why it was cascading (there has been much modern modification of the Giza Plateau), what effects it had on the stone, and so forth, are all open questions. Harrell's musings should not be considered to invalidate the serious geological investigations that have been undertaken on the Giza Plateau.

Harrell goes on to suggest that surface rainfall runoff is not really that important anyway, and states his belief that much of any rainfall will "sink into the limestone through its myriad fractures (joints) and then travel through these as well as along the bedding planes between the limestone layers." This hypothesis, of course, counters his previous anecdotal evidence concerning a "torrent of water cascading into the enclosure during a rain storm." To be blunt, I don't believe Harrell has any evidence that this is the case—it is pure speculation on his part. It is important for Harrell to hypothesize this, however, if he wants to retain the traditional attribution of the Great Sphinx to Khafre of the Fourth Dynasty. Reader has made a strong case that surface runoff was responsible for the specific degradation features and their distribution seen in the Sphinx enclosure, and there was not sufficient runoff after the quarrying work done in conjunction with Khufu's pyramid (the Khufu quarry would have impeded surface runoff toward and into the Sphinx enclosure) to account for the pattern of degradation. Harrell argues (what he calls an "educated guess"): "The Khufu quarry would be no barrier to the subsurface flow of water and might even serve to collect the surface runoff and then channel it through the limestone on the west side of the Sphinx enclosure. I [i.e., Harrell] would expect it to emerge on the western walls as spring-like seepages along the bedding planes." In fact, there is no evidence for such a process. I have studied the western wall of the Sphinx enclosure closely and I have observed no signs of such spring-like seepages, either in the recent or distant past. Indeed, this type of water flow through and over the limestones of the Giza Plateau would give a very different pattern of degradation than is actually observed. Simply put, the evidence does not support Harrell's "educated guess" whereas it does support Reader's analysis. Unfortunately for Harrell and traditional Egyptologists, the evidence is not compatible with the traditional attribution of the Great Sphinx to Khafre, circa 2500 B.C. *[For further discussion of this and related issues, see the exchange between Reader (2006a, 2006b) and Vandecruys (2006a, 2006b).]*

[Another early critic, Frank Yurco (1991; see also Raymond, 1991) tried to dismiss my evidence for an older Sphinx as simply the result of "poor limestone" and Nile floods. These are bogus arguments that continue to be recycled by the skeptics, debunkers, scoffers, and "paradigm police" (those who want to maintain the status quo—in this case the dating of the Great Sphinx to 2500 BCE—

no matter what the evidence may indicate). At the time I responded to Yurco as follows:

Yurco raises a number of issues which may superficially sound convincing, but do not stand up to close scrutiny. Yes, the body of the Sphinx is composed of a very poor-quality limestone, and the base of the Sphinx was subjected to the highest Nile floods; flood waters are known to have flooded the bases of the Sphinx and Valley Temples and lapped around the bottoms of the paws of the Sphinx in historical times. However, these observations do not falsify my hypothesis of an older age for the Sphinx.

If the water erosion seen on the body of the Sphinx and the walls of the Sphinx ditch was due primarily to the periodic Nile flooding, one would expect the heaviest erosion to be at the base, resulting in the undercutting of the limestone. Instead what one observes on the body of the Sphinx and along the walls of the Sphinx enclosure is that the heaviest erosion has occurred at the top of the back and neck of the Sphinx, consistent with precipitation-induced erosional features. The head is composed of harder, probably partially dolomitic, limestone that was probably recarved in dynastic times. Contra Yurco, there is no solid evidence that the limestone of the head ever capped the rest of the Giza Plateau, and, as far as is known, the cores of the pyramids are not composed of this limestone.

If we are to explain the observed erosional features via Nile floods, as Yurco suggests, we must posit that the Sphinx was consistently flooded at least up to its neck in standing water for much of the period between its initial carving (standardly said to be circa 2500 B.C.) and the first ancient repair campaigns that attempted to restore the outlines of its badly eroded body (these initial repairs were carried out no later than circa 1400 B.C., according to the consensus of the Egyptological community).

Based on historical records, it is known that rather than being flooded, the Sphinx was buried in desert sands during much of this period. Furthermore, even if it were the case that the Sphinx was flooded up to its neck consistently during this time period, this does not explain why the limestone around the base of the Sphinx shows major discrepancies in the depth of weathering, as seen on seismic-refraction profiles. Rather than hypothesize such drastic flooding, I suggest that the body of the Sphinx was eroded by precipitation during the wet period of circa 7000 or 5000 to 3000 B.C. This, of course, means that the body of the Sphinx dates back to at least this time period.

Once one abandons the notion that the "water damage" (as Yurco calls it) seen on the Sphinx was produced primarily by gigantic floods that covered the back and reached to the neck of the Sphinx, it becomes valid to compare the weathering modes exhibited by the Sphinx to those exhibited by somewhat higher-lying tombs cut from the identical bedrock as the Sphinx. The overall pattern one observes is predominantly well-developed, precipitation-induced erosion on the body of the Sphinx and the walls of the Sphinx enclosure, as compared to the predominantly wind-induced erosion seen on the Old Kingdom tombs. These observations are compatible with my hypothesis that the body of the Sphinx predates Old Kingdom times and suffered an earlier and wetter climatic regime. These observations are virtually impossible to explain within the context of insisting that the Sphinx dates back no further than Old Kingdom times. . . .

In his letter, Mr. Yurco succinctly presents the traditional story told by Egyptologists as to why and when the Great Sphinx was built by the Old Kingdom Egyptians; unfortunately *this standard story does not hold up under close examination. I suggest that the Egyptological community needs to rethink its story. (Schoch, 1992c)]*

Corroborative Geological Studies Concerning a Greater Antiquity for the Sphinx

Two important geological studies have recently been carried out that go a long way toward supporting my basic analyses concerning the origins and history of the Great Sphinx. The first study, by the geologist David Coxill (1998), has already been mentioned and quoted above. After confirming my observations on the weathering and erosion of the Sphinx, and pointing out that other explanations (for instance, as proposed by Gauri and Harrell) do not work, Coxill clearly states (page 17): "This [the data and analysis he covers in the preceding portions of his paper] implies that the Sphinx is at least 5,000 years old and pre-dates dynastic times." Coxill then discusses very briefly the seismic work that Thomas Dobecki and I pursued and my estimate of an initial date of 5000 to 7000 B.C. for the earliest parts of the Sphinx based on the seismic data. He neither supports nor refutes this portion of my work, but simply writes (page 17): "Absolute dates for the sculpturing of the Sphinx should be taken with extreme caution and therefore dates should be as conservative as possible—until more conclusive evidence comes to light." I can understand that he could take this stance, although perhaps I feel more comfortable with, and confident in, the seismic analysis we did. Coxill, in the next paragraph of his paper (page 17), continues: "Nevertheless, it [the Sphinx] is clearly older than the traditional date for the origins of the Sphinx—in the reign of Khafre, 2520–2490 BC."

Another geologist, Colin Reader, has also pursued a meticulous study of weathering and erosion (degradation) features on the body of the Sphinx and in the Sphinx enclosure. This he has combined with a detailed analysis of the ancient hydrology of the Giza Plateau. Although as of this writing, his research has apparently not been formally published in journal or book form, Reader has been circulating his work as an illustrated paper entitled "Khufu Knew the Sphinx" (the copy I received from him is dated July 1998). *[Since the original version of this article was written, Reader has published various papers on the subject that either reiterate or elaborate on the material in his 1998 paper, which I had in hand at the time I first wrote this article; see the references I have added to the bibliography.]* Like Coxill, Reader points out the problems and weaknesses in the arguments of my opponents. Reader notes (quoted from the summary of his paper; no page number), that there is "a marked increase in the intensity of the degradation [that is, weathering and erosion] toward the west [western end] of the Sphinx enclosure." Reader continues, "In my opinion, the only mechanism that can fully explain this increase in intensity is the action of rainfall run-off discharging into the Sphinx enclosure from the higher plateau in the north and west. . . . However, large quarries worked during the reign of Khufu [a predecessor of Khafre, the 'traditional' builder of the Sphinx] and located immediately up-slope, will have prevented any significant run-off reaching the Sphinx." Thus Reader concludes (page 11 of his paper) that "When considered in terms of the hydrology of the site, the distribution of degradation within the Sphinx enclosure indicates that the excavation of the Sphinx pre-dates Khufu's early Fourth Dynasty development at Giza." Interestingly, Reader also concludes that the so-called "Khafre's" causeway (running from the area of the Sphinx, Sphinx Temple, and Khafre Valley Temple up to the Mortuary Temple on the eastern side of the Khafre pyramid), part of "Khafre's" Mortuary Temple (*[the eastern portion,]* which Reader refers to as the "Proto-mortuary temple"), and the Sphinx Temple predate the reign of Khufu. *[Reader (2002) has also suggested that the tomb of Khentkawes and the tomb of Kai, both cut from the bedrock of the Giza Plateau, may date to prior to the Fourth Dynasty. In particular, Reader suggests that on the basis of their architectural style (with niched-facades) and the weathering and erosion patterns they show, these structures may date to the early dynastic period.]*

As I have discussed in my book, *Voices of the Rocks* (Schoch with McNally, 1999, 2000), I have come out strongly in favor of not only an older Sphinx, but also a contemporaneous (*[contemporaneous with the core-body of the Great Sphinx,]* thus older) Sphinx Temple (at least the limestone core being older than the Fourth Dynasty). Independently of Reader, John Anthony West and I have also concluded that part of "Khafre's" Mortuary Temple *[the eastern portion composed of megalithic or cyclopean limestone blocks]* predates Khafre. Reader has now come to the same conclusion concerning "Khafre's" Mortuary Temple. I am pleased to see his confirmation. *[John Anthony West and I had also, before becoming aware of Reader's analyses, discussed the possibility that the "Khafre Causeway" and the tomb of Khentkawes most likely predate the Fourth Dynasty. However, my focus was on the Great Sphinx and the Sphinx and Valley Temples. My tentative hypothesis was (and still is) that these three structures were built first, many millennia prior to dynastic Egypt. Later, the oldest portion of "Khafre's Mortuary Temple" was constructed, and still later (in earliest dynastic times, prior to Old Kingdom times) the tomb of Khentkawes was constructed. Furthermore, the sites of the three major pyramids on the Giza Plateau probably go back to the earliest "Sphinx Age." The Great Pyramid (Khufu's pyramid) was built on a preexisting natural, yet sacred, mound into which the original descending passage and subterranean chamber had been carved prior to dynastic times. The Second Pyramid (Khafre's pyramid) sits on an earlier site and structure, the remains of which can still be seen at its base, carved into the bedrock. Likewise, I believe the Third Pyramid (Menkaure's pyramid) sits on and over an older site. In Old Kingdom times the sites of the three pyramids, along with the original Great Sphinx and its associated temples, were appropriated, refurbished, and built on. The fact that the Second Pyramid had a ring or band of granite facing stones around its base in Old Kingdom times and that the Third Pyramid was partially or completely covered with granite facing stones (granite was used to refurbish and renew older structures) indicates that these pyramids cover older structures or sites that were restored, refurbished, or renewed. Likewise, at Dahshur the "Red Pyramid" or "North Pyramid," attributed to the pharaoh Sneferu (ca. 2600 BCE), apparently contains within it the remains of a much older, highly weathered and eroded structure. It appears that the Red Pyramid was purposefully built over a much older structure, thus preserving and protecting it. (Sneferu was the founder of the Fourth Dynasty, who ruled Egypt in the late twenty-seventh to early twenty-sixth century BCE. Khufu, the reputed builder of the Great Pyramid at Giza and his successor as pharaoh, was one of Sneferu's sons.)]*

One should note that Reader clearly accepts the Sphinx Temple as predating Khufu, and if it is correct that the Valley Temple was constructed from limestone blocks that came out of the Sphinx enclosure at a higher level than the blocks that were used to build the Sphinx Temple (as clearly stated by Lawton and Ogilvie-Herald in their book on page 329; I believe they may be correct here), then the Valley Temple must also be pre-Khufu (as West and I have hypothesized and advocated all along).

[Regarding the Sphinx Temple and Valley Temple, Lehner (1980) suggested that the Valley Temple may have been constructed prior to the Sphinx Temple, in that when the ancients were preparing the site for the Sphinx Temple they excavated blocks that may have been used to construct the core of the Valley Temple. Lehner wrote:

> *To quarry out the Sphinx and to produce core-blocks for its temple [Sphinx Temple] in the same process would have been most economical of time, labor, and materials. The question arises, however, as to why the core-blocks of the Sphinx Temple were not taken immediately from the quarrying that formed its lower terrace—the stone there is of better quality—or why the walls of this temple were not entirely fashioned directly from parent rock, as is the*

> *case with the lower parts of the walls of the westernmost rooms. One possible answer—which needs further investigation—is that much of the stone extracted from what became the lower terrace was used in the construction of the adjacent Valley Temple. As a working hypothesis, then, we suggest that many of the core-blocks for the Valley Temple were extracted from the quarrying that formed the lower terrace of the Sphinx complex, and upon this terrace the Sphinx Temple was constructed of core-blocks taken from quarrying that fashioned the Sphinx*. (Lehner, 1980, p. 15)

It is well established that the limestone core blocks used to build the Sphinx Temple were quarried from the Sphinx Enclosure; see Reader (2002), where he writes, "A study of the distribution of fossils within the limestones at Giza has established that the masonry used to construct the Sphinx temple was quarried from within the Sphinx enclosure itself."

Lehner (1980, p. 15; comments in brackets by R. Schoch) also notes, "The core work of the Valley temple [Temple] also shows some continuous stratification running through adjacent core-blocks, and at least some of these might also be from Bed 2 [that is, the rock strata that were excavated to form the core body of the Great Sphinx]."]

Reader tentatively dates the "excavation of the Sphinx" and the construction of the Sphinx Temple, Proto-Mortuary Temple, and "Khafre's" causeway to "sometime in the latter half of the Early Dynastic Period [page 11]" (that is, ca. 2800 to 2600 B.C. or so) on the basis of "the known use of stone in ancient Egyptian architecture" [page 8]. I believe that Reader's estimated date for the excavation of the earliest portions of the Sphinx is later than the evidence indicates. I would make three general points:

1) In my opinion, the nature and degree of weathering and erosion (degradation) on the Sphinx and in the Sphinx enclosure is much different than what would be expected if the Sphinx had not been carved until 2800 B.C., or even 3000 B.C. Also, mud-brick mastabas on the Saqqara Plateau, dated to circa 2800 B.C., show no evidence of significant rain weathering, indicating just how dry the climate has been for the last 5,000 years. I continue to believe that the erosional features on the Sphinx and in the Sphinx enclosure indicate a much earlier date than 3000 or 2800 B.C. It strains credulity to believe that the amount, type, and degree of precipitation-induced erosion seen in the Sphinx enclosure was produced in only a few centuries.

2) In his July 1998 paper Reader never addresses the seismic work that we pursued around the Sphinx, which is in part the basis I used to calibrate a crude estimate for the age of the earliest excavations in the Sphinx enclosure. In my opinion, the date estimate based on our seismic work is compatible with the type and amount of erosion and weathering seen in the Sphinx enclosure, and also nicely correlates with the known paleoclimatic history of the Giza Plateau. *[In later published papers, such as his 2002 article, Reader does address the seismic data, but he misinterprets it and then dismisses it out of hand. For a discussion of the seismic data, including corrections to the misunderstandings and misinterpretations of various critics, including Reader, see chapter 2.]*

3) I do not find dating the Sphinx on the basis of "the known use of stone in ancient Egyptian architecture" convincing. I would point out that massive stonework erections were being carried out millennia earlier than circa 2800 B.C. in other parts of the Mediterranean (for instance, at Jericho in Palestine). [*Since this was written, Göbekli Tepe in southeastern Turkey, constructed of beautifully carved megalithic pillars dating back to the tenth millennium BCE, has been uncovered. In a broader perspective, this certainly establishes*

the use of stone for architectural purposes some eleven thousand to twelve thousand years ago (Schoch 2012).] Even in Egypt, it is now acknowledged that megalithic structures were being erected at Nabta *[Nabta Playa]* (west of Abu Simbel in Upper Egypt; discussed in the text of my book, *Voices of the Rocks*) by the fifth millennium B.C. and the predynastic "Libyan palette" (circa 3100–3000 B.C.), now housed in the Cairo Museum, records fortified cities (which may well have included architectural stonework) along the western edge of the Nile delta at a very early date. I find it quite conceivable that architectural stonework was being pursued at Giza prior to 2800 or 3000 B.C.

Reader suggests that the head of the Sphinx may have originally been a prominent rock outlier that was first carved into some type of head (perhaps initially a lion, Reader suggests—likewise, J. A. West and I hypothesized that the Sphinx may have originally been a lion in the 1993 video *The Mystery of the Sphinx [This is the documentary that first aired in the United States on NBC in 1993.]*) and *[was]* later recarved. Independently, I have come to similar conclusions relative to the head of the Sphinx once having been a prominent rock outlier, and I have stated so publicly *[and this was shown diagrammatically in* The Mystery of the Sphinx*]*. In my 1992 *KMT* paper I point out that while Farouk El-Baz's yardang (natural wind-shaped hill) hypothesis for the Sphinx as a whole is untenable (see El-Baz, 1981, 1982), the head may have originally been a yardang (which would mean that it was some kind of rock outlier), but it is too heavily modified by carving and recarving to know for certain.

As far as I am concerned, Reader is one more geologist who has corroborated my basic observations and conclusions. The oldest portions of the Sphinx date back to a period well before circa 2500 B.C.

[Here I want to point out that, interestingly, although Reader maintains that the Great Sphinx and associated structures date to early dynastic times, he associates the Great Sphinx with an early solar cult.

> *As the techniques of stone masonry and the theology of the solar cult developed in the Early Dynastic period, the Sphinx was carved from the limestone bedrock (possibly with the head of a lion), whilst the temples to the rising sun (the Sphinx temple) and the setting sun (the proto-mortuary temple) were built at the eastern and western "limits" of the site, linked by the causeway. In the 4th Dynasty, it was the established association of Giza with sun-worship which led Khufu to select this location as the site of his mortuary complex. This may explain the name given to Khufu's pyramid—"the pyramid which is the place of sunrise and sunset." (Reader, 2002; the quotation within this quote is cited by Reader as from J. Baines and J. Málek,* Atlas of Ancient Egypt, 1980, p. 140.)

Reviewing my early work on redating the Great Sphinx, Reader (2002) commented, "Unsurprisingly, Schoch's conclusions regarding the geology and its implications for the age of the Sphinx were rejected by Egyptologists. Great effort was put into countering what was widely regarded as a 'heresy.'" I may be guilty of heresy in the eyes of some, but there are even more extreme heretics when it comes to the use of geology in attempts to date the Sphinx. A case in point is a paper titled "Geological Aspect of the Problem of Dating the Great Egyptian Sphinx Construction," in which two members of the National Academy of Sciences of Ukraine, Vjacheslav I. Manichev and Alexander G.

Parkhomenko (2008), citing my work on the redating of the Great Sphinx (as summarized in Schoch and McNally, 2005), reinterpret the geological and erosional features on the Great Sphinx as indicating that the core body of the statue could date back as far as eight hundred thousand years ago! And they are not referring to simply a natural outcropping that may have existed eight hundred thousand years ago that was later shaped into a statue. Personally, I am not convinced that the Great Sphinx is anywhere close to the age postulated by Manichev and Parkhomenko, but it is satisfying that they too acknowledge that the geology of the Great Sphinx is not compatible with the conventional status quo Egyptological dating of the monument to circa 2500 BCE.]

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APPENDIX 8

Was the Great Sphinx Surrounded by a Moat? Was the Sphinx Originally Anubis?

Robert M. Schoch

This appendix is reprinted, with slight modifications, from my (Robert Schoch's) 2012 book, Forgotten Civilization: The Role of Solar Outbursts in Our Past and Future *(Rochester, Vermont: Inner Traditions), pp. 260–270. It addresses various issues regarding not only whether or not the Great Sphinx was originally a jackal rather than a lion, a topic that many of our readers have asked about, but it addresses various aspects of the geology of the Great Sphinx in greater detail as well. It is important to include this material in a book devoted to the Great Sphinx.*

The notion that the Great Sphinx of Egypt has its origins in extreme antiquity, dating back to at least circa 5000 BCE and quite conceivably 10,000 BCE or earlier, is an argument that I have developed over a quarter century based on painstaking analyses of the geology of the Giza Plateau (where the Great Sphinx and Great Pyramid are located). Conventional Egyptological thinking dates the Sphinx to circa 2500 BCE, during the Fourth Dynasty of the Old Kingdom. My dating places its origins long before the rise of dynastic Egypt, back to a time when, according to the traditional paradigm, high culture and civilization did not exist.

Recently my work on the Great Sphinx has come under fire from a self-described antiestablishmentarian. Given the number of people who have been asking me about this latest "Sphinx theory," I feel it is imperative that I briefly address it here. While I eschew personal attacks and try to let unwarranted criticism of my work (typically by people lacking geological expertise but with personal agendas to defend) roll off my back, in some situations the unfounded attacks need to be addressed. This is particularly the case when the attacks are part of a weighty volume that purports to offer a new interpretation of the Great Sphinx, one that supposedly overthrows my decades of analyses. I refer specifically to *The Sphinx Mystery: The Forgotten Origins of the Sanctuary of Anubis* by Robert Temple with Olivia Temple (2009).

Here I will first summarize Robert Temple's theory and list six major points that disprove it. I will then briefly comment on his book specifically. This discussion will not only serve to rebut Temple's ill-founded hypothesis, but also to elaborate and clarify some of the details on which my analyses of the Great Sphinx are based.

ROBERT TEMPLE'S MOAT THEORY

Robert Temple (Temple 2009; Temple with Temple 2009) has proposed a moat theory (that is, the Sphinx Enclosure was purposefully filled with water such that the body of the Sphinx was submerged and sat as a statue in a small artificial lake) to explain the signs of water weathering and erosion on the body of the Great Sphinx and on the walls of the Sphinx Enclosure. Temple contends that the moat theory explains the data adequately without hypothesizing that the Great Sphinx dates back to a much earlier period during which there was more rainfall than at present.

The body of the Sphinx, carved from the bedrock, sits largely below ground level, and various moat, pool, or artificial fountain hypotheses have been suggested for the Sphinx from time to time. I considered such notions carefully as far back as my early analyses of the geology of the Sphinx, starting in 1990. In summary, such moat theories and related theories do not hold water (to use a bad pun) and are not compatible with the features of the actual Great Sphinx, the Sphinx Enclosure, and the general geology and paleohydrology of the Giza Plateau.

SCRUTINIZING THE SPHINX

During a March 2009 trip to Egypt, just after becoming aware of Temple's hypothesis, I made it a point to look at the Great Sphinx and Sphinx Enclosure with fresh eyes to see if there could be anything to the moat class of theories. I will summarize briefly a half-dozen points (for more details pertaining to some of these points, as well as various comments on the criticisms of K. Lal Gauri and his colleagues of my work, as cited by Temple with Temple [2009], see Schoch 2002).

1. Based on my observations and analyses, the Sphinx Temple (built out of blocks removed from the Sphinx Enclosure when the body of the Sphinx was initially carved) and the so-called Valley Temple to the south of the Sphinx Temple show clear signs of heavy precipitation-induced weathering and erosion on the limestone core blocks. These limestone temples were subsequently refurbished with Aswan granite ashlars during the Old Kingdom or earlier (as evidenced by an Old Kingdom inscription—which conceivably could have been added to a still older block—still found on a block located at the Valley Temple). The moat theory cannot explain the nature of the very ancient weathering seen under the Old Kingdom granite veneer.
2. There is much heavier surface erosion on the western end of the Sphinx Enclosure, and the surface erosion tapers off dramatically toward the eastern end of the enclosure. This is exactly what is to be expected based on the paleohydrology of the Giza Plateau and is incompatible with a moat theory where it is hypothesized that water was brought in from the Nile to the east. Furthermore, the nature of the surface erosion throughout the enclosure and on the body of the Sphinx is as expected if there were water running over or raining down on the rock layers. The erosion actually observed is not compatible with pooled water in the enclosure.
3. The highest levels of the middle member strata, as seen in the Sphinx Enclosure on the western end, are most severely eroded, which is compatible with the agency of precipitation and water runoff. If the moat theory were true, then the lower strata on the eastern end of the Sphinx Enclosure would be most heavily eroded (caused by water being brought in via canals from the Nile), but the opposite is seen in reality. Indeed, the evidence is clear that the water erosion is due to precipitation and runoff,

not from water and flooding of any type coming from lower elevations, such as the rising of the Nile.

4. The subsurface seismic data demonstrating the depth of weathering below the floor of the Sphinx Enclosure, based on my analyses (using areas excavated during the Old Kingdom for comparison), even when calibrated very conservatively, give an age of initial carving for the core body of the Great Sphinx of at least 5000 BCE. More than one geological colleague has suggested to me that a more realistic calibration gives a date thousands of years earlier. And no, it is not the case that standing water in the Sphinx Enclosure would accelerate the depth of weathering below the floor of the enclosure.
5. The vertical fissures observed in the walls of the Sphinx Enclosure show diagnostic signs of having been formed by precipitation and water runoff. In my opinion, they do not show any characteristics that are diagnostic or even suggestive of having been formed by artificial dredging of the Sphinx Enclosure, as some have suggested.
6. If the Great Sphinx actually had sat in an artificial pool or lake, either the water level around the Sphinx would have had to have been the same as that of the surrounding water table or the walls and floor of the pool in which the Sphinx sat would have had to have been sealed up and watertight (and any artificial walls, such as on the eastern end, would have had to have been strong enough to withstand the pressure of the water). Clearly, the ancient water table was well below the level of the floor of the Sphinx Enclosure (or else the Sphinx Temple, for instance, would have been flooded). Due to the nature of the local geology (discussed under the heading "Geological Details," below), the Sphinx Enclosure could not have held a deep pool of standing water.

ANCIENT RAINS OR A MOAT?

Temple cites John Anthony West (who is responsible for my initial involvement with the Sphinx over two decades ago), Graham Hancock, and Robert Bauval as the "popular writers who have campaigned for the idea that the Sphinx is of immense antiquity" (Temple with Temple 2009, 242). Temple recounts the gist of the argument: the Sphinx shows "water erosion" (Temple's term), Egypt is known today for its desert environment, and heavy rainfall occurred in Egypt in earlier times, therefore the Sphinx must date back to those earlier times ("about 10,000 BC" is the date Temple attributes to West, Hancock, and Bauval).

Temple states his own position as such: "I was never convinced by this argument from the very beginning for the simple reason that there is just no archaeological record at all for any important civilization during approximately seven thousand years of the time postulated between the 'ancient rain' and the apparent beginnings of high civilization in Egypt" (Temple with Temple 2009, 243).

Temple's argument might have carried some weight twenty-five years ago, but we now have the amazing megalithic site of Göbekli Tepe in Turkey, just north of the Syrian border (admittedly not in Egypt, but certainly close enough geographically to pertain to the argument; see Schoch 2012). Independent of the Great Sphinx, this well-dated site provides definitive evidence that high culture dates back to at least eleven thousand to twelve thousand years ago!

Temple accepts that "the apparent evidence of water erosion [in the area of the Sphinx] is so blatantly obvious to anyone that for someone supposedly knowledgeable wholly to deny it looks disingenuous" (Temple with Temple 2009, 243).

Temple proposes an alternative theory to explain the evidence: "*that the Sphinx Pit* [Sphinx Enclosure] *was once a moat filled with water, and that the Sphinx was an island*" (Temple with Temple

2009, 244, italics in the original).

Having studied the evidence for the last twenty-five years (I, like Temple, have had access to the interior of the Sphinx Temple, the Sphinx Enclosure, and other areas that are off limits to the general public), I feel confident in repeating my statement that Temple's moat theory simply does not hold water. I will now further elaborate on only a few salient points that counter Temple's argument.

GEOLOGICAL DETAILS

An important fact is that the current top of the westernmost end of the southern wall of the Sphinx Enclosure is at least 6 to 7.5 meters higher in elevation than the current top of the eastern end of the same wall (as can be seen on the contour map reprinted on page 534 of Temple's book). The eastern end of the enclosure includes the western wall of the Sphinx Temple, which Robert Temple believes formed the eastern wall of the moat. The actual difference between the tops of the walls is perhaps nearly twice as much when comparing the highest point at the northwest corner of the Sphinx Enclosure to the lowest point at the top of the wall in the southeast corner. Water seeks its own level, thus since we find clear and prominent evidence of water erosion at the top of the far western end of the enclosure, if the moat theory were correct, the eastern end of the Sphinx Enclosure, as well as the walls along the southern and northern sides, would have had to have reached a comparable height as the western end, up to 6 to 7.5 meters or more higher (and perhaps nearly twice that in the far southeast corner) than the walls that currently remain. These would have been substantial structures indeed to hold back the pressure of such a large body of standing water, and in sum there is no definitive evidence for such structures, although Temple argues that various constructions to the east of the Sphinx Enclosure were removed. Furthermore, such a deep pool of water would not leave any portion of the current body of the Sphinx as an island, but would submerge it completely.

Another key point is that the Sphinx Enclosure is highly faulted and jointed. Additionally, the limestone bedrock is characterized by karst topography, with numerous openings and cavities through which water can drain. Indeed, it would leak like a sieve (another bad analogy, perhaps). To put it simply, I do not believe that the Sphinx Enclosure, even with massive walls built around it as described above, would hold a large standing body of water. The water would leak out into the numerous cavities and tunnels below the Sphinx and into the Giza Plateau more generally. In order to hold water without leaking, the bedrock and sides of the enclosure would have to be sealed up. This could conceivably have been done with some sort of mortar, cement, brick, or tile combination, but there is no evidence that this was the case. In fact, there is clear evidence that the rock forming the sides of the enclosure was left bare. If the rock had been covered, sealed, and protected, then it would not show the well-developed water erosion features that we observe to this day and that even Temple puts so much stock in. Furthermore, if the enclosure had been sealed in such a manner, this would not be compatible with the dredging theory, advocated by Temple, to account for the vertical fissures. These features and their distribution are the signs of rain and water runoff from higher up on the plateau to the west and north; they are incompatible with a moat theory.

In his book, Temple misrepresents various geological details, convoluting the facts to prop up his moat theory. For instance, he includes a photograph of what he refers to as "the swirling pattern in the rock where the water entered from the channel and then passed to the right into the open Sphinx Moat" (Temple with Temple 2009, 271). The features shown in the photo are actually nothing of the sort. They were formed millions of years ago due to mineralogical and chemical migration as the layers of limestone, which originally formed at the bottom of an ocean, were gradually uplifted and the water table receded. K. Lal Gauri and J. K. Bandyopadhyay explain this point in their book *Carbonate Stone* (1999), a work that Temple cites but perhaps did not read carefully.

SUBSURFACE WEATHERING

Temple clearly and purposefully misrepresents my work when he writes, “There is one other major point in Schoch’s book [with Robert Aquinas McNally, *Voices of the Rocks* (1999)] that should be mentioned. He says that he determined through his geological investigations of the Sphinx Pit that there was deeper erosion to the north, south, and east of the Sphinx in the floor of the moat than there is to the west. This discovery substantiates the hypothesis of a moat fed from the east by the Nile” (Temple with Temple 2009, 289; material in brackets added by R. Schoch).

To put it simply, this is a complete fabrication on the part of Temple! What I wrote, which is also explained in detail in the academic paper that Thomas Dobecki and I (Dobecki and Schoch 1992) published but Temple never cites, although I list the reference in *Voices*, is this: “The north, south, and east floors of the trench surrounding the east-facing Sphinx are weathered to a depth of six to eight feet [approximately 1.8 to 2.5 meters] below the level of the enclosure’s currently exposed surface. On the monument’s western end, the Sphinx’s rump, the weathering extends to only four feet [1.2 meters]” (Schoch with McNally 1999, 40; material in brackets added by R. Schoch).

Self-styled expert on geological erosion and weathering that he is, Temple must clearly know the difference between surface erosion (the breakdown and removal of material) and subsurface weathering (mineralogical changes without substantial removal of material). While the surface erosion is more pronounced on the western end of the Sphinx Enclosure, where the rocks are topographically higher and caught the brunt of rainwater runoff from the plateau in the period prior to dynastic times, the subsurface weathering below the floor of the Sphinx Enclosure is shallower on the western end. This does not support Temple’s moat theory at all, but in fact contradicts it.

If the moat theory were correct, with water flowing in from the east, then the surface erosion, and not the depth of subsurface weathering, should be greatest on the eastern end. Since the floor of the Sphinx Enclosure is more or less at the same elevation across its surface, water entering from the east would quickly reach the western end (again, water seeks its own level), and once a meter or so depth of water was in the enclosure, the entire floor would be covered with water. Furthermore, the depth of the subsurface weathering is not dependent on the surface being covered with water. The depth of subsurface weathering is a function of how long ago the rock floor was exposed, not how much water has flowed over it.

The reason the subsurface weathering is less deep on the western end is that originally the rump of the Great Sphinx was carved down only to the depth of the lower ledge or terrace directly behind the Sphinx. Originally the Sphinx emerged from the bedrock. The sides and eastern portion show deeper subsurface weathering because they were totally carved down to the current floor of the Sphinx Enclosure thousands of years earlier than the rump, which, based on my analyses, was fully carved down to the current floor as part of the refurbishing of the statue during Old Kingdom times, circa 2500 BCE.

SPHINX OR JACKAL? LION OR DOG?

A major thesis of Temple's book is that the Great Sphinx was not originally a sphinx, but a jackal (wild dog) representing the god Anubis. My gut reaction is that if the Great Sphinx was initially meant to represent Anubis, then it should be facing west and not east. Anubis was associated with the west and the "land of the dead," which was considered to be in the west. Be this as it may, let us look further at the jackal versus lion controversy.

Traditionally the body of the Sphinx has been viewed as that of a lion, and I (among others) have suggested that originally it was a statue of a lion. Temple argues that the body of the Sphinx cannot represent a lion because its back is flat and straight, whereas a lion has a massive chest and the back rises to the front. Temple contests that the straight back of the Sphinx matches that of Anubis as a jackal in its characteristic crouched pose with its forelimbs stretched before it. This may be so, but for me it is a moot point.

The body of the Sphinx is highly weathered and eroded, and I believe that the current flat state of its back is primarily a function of a flat geological bedding plane level, down to which the rock has eroded (I have had the opportunity to walk on the back of the Sphinx and inspect it closely). The flat back is not how it was originally carved. Indeed, no significant original carved surfaces on the body of the Sphinx remain exposed for inspection. The body's surface is entirely weathered and eroded, in many places by a meter or more, and we just do not know what the exact original outlines of the body looked like. However, the curving tail on the right side of the body of the Sphinx, reconstructed in limestone blocks that have been used to fill in and repair the erosion, is much more leonine than jackal-like (in ancient Egypt, Anubis as a jackal generally had a straight tail, often hanging down, very unlike the current curved tail of the Sphinx). I do not believe that we can definitively say what the original body of the Great Sphinx looked like, but it certainly is compatible with that of a lion.

The current head of the Great Sphinx is that of a human, and the modern, conventional Egyptological view is that the face represents the Old Kingdom pharaoh Khafre, reputed builder of the Great Sphinx in circa 2500 BCE. I have made it very clear in my work that I do not believe the current head of the Great Sphinx is the original head. It is proportionally too small for the body and has been recarved. Furthermore, I have been explicit in suggesting that the current head of the Great Sphinx is not that of Khafre, and I discuss this at length (citing the work of the forensic expert Frank Domingo) in *Voices of the Rocks* (Schoch with McNally 1999), yet Temple (Temple with Temple 2009, 288) suggests that I believe the face of the Sphinx is that of Khafre. The truth is that I have suggested that the current pharaonic head is a recarving, perhaps dating to early dynastic times (Temple dates the current head to the Middle Kingdom, asserting that the face seen on the Sphinx is that of the Middle Kingdom pharaoh Amenemhet II, nineteenth century BCE). Since Temple ostensibly read my book, either he suffered from a lapse of memory or he is purposefully misstating my position.

Temple suggests that originally the head on the Great Sphinx was that of a jackal, with elongated snout and upright pointed ears. The current head, according to Temple, was recarved from the neck portion of the original jackal head. Studying the original statue, there is really no way to confirm Temple's hypothesis of a jackal head, but from my perspective as a geologist, it seems highly unlikely. According to Temple's hypothetical reconstruction, the missing jackal ears situated above the level of the current head were over nine meters tall, and the face and snout of the jackal extended out from the current face by over nine meters. While the dolomitic limestone from which the head is carved might have been able to support a pair of nine-meter-tall vertical ears, I question whether the rock would have been strong enough to support a nine-meter projecting face and snout without anything propping it up from underneath. At best, positing a jackal face on the statue is wild speculation and highly questionable.

All in all, after poring through Temple's book, my conviction that the Great Sphinx has its origins thousands of years before dynastic times remains as strong as ever. Furthermore, unless better evidence than that which Temple presents comes along, I will continue to think of the Great Sphinx as a sphinx or as a lion that was later recarved with a human head. The nobility, the grandeur, and the mystery of the Great Sphinx remain intact.

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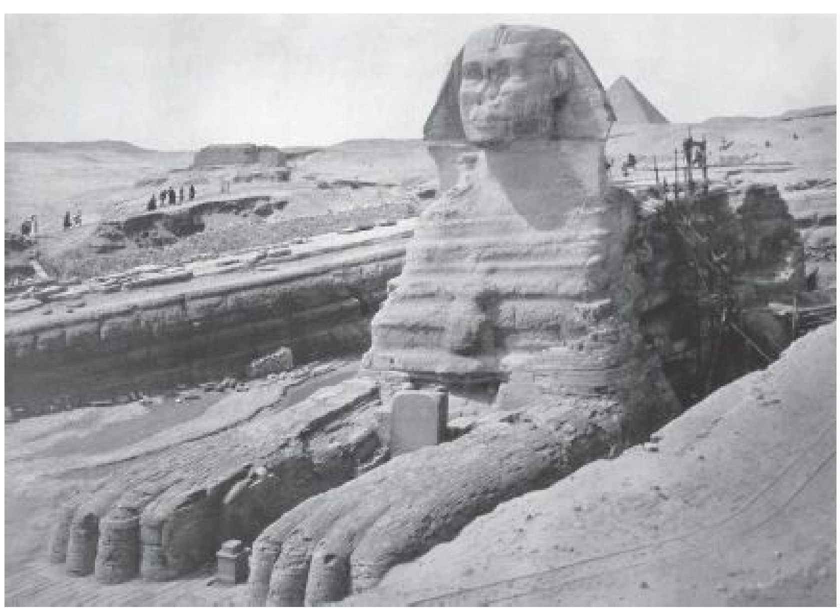

Fig. A8.1. The Great Sphinx, circa 1926, showing then-recent excavations and restorations, including cracks that were *filled in with cement; published in National Geographic, September 1926. (Collection of R. Schoch.)*

APPENDIX 9

Controversies concerning the End of the Last Ice Age

Robert M. Schoch

The end of the last ice age, nearly 12,000 years ago, was a pivotal time not only in the history of our planet, but also for early cultures and civilizations during those tumultuous times. There were rapid climatic and environmental changes, as well as catastrophic geologic changes. Massive ice sheets (on the order of kilometers thick) quickly melted at high latitudes in the northern hemisphere; pressure was released from the crust setting off a cascading effect of earthquake and volcanic activity (Hoek 2008, 227, and references cited therein). Massive amounts of moisture in the atmosphere fell to the surface of Earth as torrential rains, causing widespread deluges and flooding. Huge quantities of fresh water dumped into the oceans upset and changed ocean circulation patterns, which in turn had further effects on the climate, as well as raising sea levels around the globe on the order of a 120 meters or more, inundating low-lying coastal areas (Carlson 2013; see discussion in Schoch with McNally 2003). The triggering mechanism for the climatic changes may have been a major solar outburst (or series of solar outbursts or major solar eruptions) which, driving plasma (electrically charged particles moving at high speeds) down to the surface of Earth, would have set widespread fires and in selected areas literally incinerated the surface of our planet (see Schoch 2012).

DATING THE END OF THE LAST ICE AGE

The exact dating of the end of the last ice age has been subject to increasing refinements over the last few decades. Geologists divide time into named units similar to the method used by historians of civilization when they distinguish, for instance, the Medieval, Renaissance, or Victorian periods. The Pleistocene, which began approximately 2.58 million years ago (Gibbard et al. 2010), was the epoch prior to the end of the last ice age and the beginning of the Holocene (which we currently live in). The Pleistocene was characterized by alternating glacial periods (ice ages) and interglacial periods. Within glacial periods, stades (secondarily cold periods with further glacial advance) and interstades (when glaciers were either at a standstill or receded slightly) are also distinguished (Schoch 1989, 357, quoting the American Commission on Stratigraphic Nomenclature 1970). Realistically, the Holocene is thus far so short in duration that it should probably be considered simply another interglacial period. Classically, for instance when I was a graduate student at Yale University in the early 1980s, the Pleistocene-Holocene boundary (sometimes referred to as the Last Glacial-Interglacial Transition) was typically dated to around 10,000 years before the present (Palmer 1983). Back then we considered the last ice age to have ended very quickly and abruptly, but we were thinking in terms of geological time, and abrupt in such a context seemed to mean that the transition occurred over some decades or perhaps even centuries.

In recent years, based on ice core data from Greenland and other detailed evidence, the end of the last ice age (Pleistocene-Holocene boundary) has been dated to "11700 calendar yr b2k (before 2000 AD) . . . with a maximum counting error of 99 yr" (Walker et al. 2009, 3; see also Walker et al. 2008, 264). That is, it is dated in real years within a century of 9700 BCE (or more precisely, within 99 years of 9703 BCE with more than 95 percent probability; Walker et al. 2009, 14, note 1). Here I should make it clear that even in the recent literature other dates are often cited for the end of the last ice age, and part of the confusion arises from different dating systems that remain in com-mon use (see Hoek 2008, and Fiedel 2011, for further discussion). For instance, uncalibrated radiocarbon (^{14}C) dates, often encountered in the older literature, can vary widely from calibrated radiocarbon dates and true "calendar year" dates. The commonly used "cal BP" (calibrated ^{14}C dates before the present, where "present" equals AD 1950) are numerically 50 years different from "b2k" and "BC" or "BCE" dates; thus 11,700 b2k = 11,650 cal BP = 9700 BC [BCE], and in colloquial terms all of these equal "11,700 years ago" or "ka" where AD 2000 is used as the easily remembered baseline for the "present" (see for instance the usage in Steffensen et al. 2008).

There has been incredible refinement in locating the exact position of the Pleistocene-Holocene boundary. Analyzing a Greenland ice core, Mayewski et al. (2014) pinpointed the last three years of the Pleistocene and the first year of the Holocene in a 5-cm-long section of the ice core. With their ultra-high-resolution laser sampling techniques involving hundreds of samples per centimeter and year of ice time (measuring such markers as calcium, sodium, and iron concentrations), these researchers have pinpointed the abrupt end of the last ice age and the onset of the Holocene to well within a year, and inspecting their published data (see for instance Mayewski et al. 2014, 102, their Figure 3), it is evident that they have refined data documenting the end of the last ice age down to the level of months, weeks, and possibly even days. The ice age ended quite suddenly indeed!

THE YOUNGER DRYAS

Interestingly, the last ice age did not just "warm" and end. Rather, in the Northern Hemisphere there was a warming period toward the end of the last ice age (the Allerød [Bølling-Allerød] warming) followed by a cold spell (cold even relative to those glacial times), known as the Younger Dryas (lasting approximately 1,200 years), before the final sudden warming. The onset of the cooling event that initiated the Younger Dryas was also quite abrupt, although perhaps not quite as abrupt as the dramatic warming that ended the Younger Dryas (thus ending the last ice age and the Pleistocene). Based on Greenland ice core data, this cooling event is dated to approximately 10,900 BCE (Steffensen et al. 2008; Hoek 2008, 227, cites a date of 12,896 b2k [= 10,896 BCE] with a maximum counting error of 138 years).

Thus the story of the end of the last ice age consists of glacial times, which suddenly (at least from a geological perspective) became even colder circa 10,900 BCE (the start of the Younger Dryas). The cold spell lasted for 1,200 years before Earth was abruptly snapped out of the last ice age (the end of the Younger Dryas) circa 9700 BCE. What are the explanations for the beginning and end of the Younger

Dryas? These are topics that have baffled geologists for decades. (As a side note, the cold period known as the Younger Dryas is named after the plant *Dryas octopetala*, an arctic-alpine member of the rose family that thrives under cold conditions.)

IMPACT HYPOTHESIS

Perhaps one of the best known and most controversial theories to explain the onset of the Younger Dryas is that a comet, meteor, asteroid, or other extraterrestrial (ET) object (a bolide) either hit Earth or exploded in the atmosphere 12,900 years ago, thus inducing the abrupt cooling event that marks the onset of the Younger Dryas. Although there were earlier theories along these lines, this idea gained widespread attention with the 2007 publication of an article by Firestone et al. that reputedly reported evidence for such an impact event. These authors proposed, "that one or more large, low-density ET objects exploded over northern North America, partially destabilizing the Laurentide Ice Sheet and triggering YD [Younger Dryas] cooling. The shock wave, thermal pulse, and event-related environmental effects (e.g., extensive biomass burning and food limitations) contributed to end-Pleistocene megafaunal extinctions and adaptive shifts among PaleoAmericans in North America" (Firestone et al. 2007, 16016).

Here I want to make it clear that the end of the last ice age does not correspond to the potential strike by a comet or meteorite hypothesized by Firestone et al. (2007), even if such did occur, as has sometimes been incorrectly reported in the popular media; for instance, a 2007 headline from *Science News* reads: "Ice Age Ends Smashingly: Did a comet blow up over eastern Canada?" (Perkins 2007). Rather, this was the onset of the Younger Dryas, circa 10,900 BCE.

The impact hypothesis has stimulated heated controversy, with arguments and counterarguments flying back and forth in the scientific literature as well as in the popular press. Personally I am not averse to an impact hypothesis per se (see Schoch with McNally 2003), and initially I found the arguments for such an impact at the beginning of the Younger Dryas quite intriguing. However, as more researchers have studied the issue, much of the data supporting the impact hypothesis has been questioned (see Schoch 2012, 296–300). For instance, Kennett et al. (2009, 1) published an article supposedly documenting the presence of "shock-synthesized hexagonal nanodiamonds (lonsdaleite)" from the base of the Younger Dryas on Santa Rosa Island, California. This, if true, would strongly support that an impact event occurred as lonsdaleite is known on Earth primarily from meteorites and impact craters (although I believe we should remain open to the possibly that it could be produced under other rare circumstances as well). However, as pointed out by Boslough et al. (2012, 22) and Daulton et al. (2016), it has since been determined that the supposed lonsdaleite is not lonsdaleite at all, but a misidentification of other material, and the same holds true of other supposed reported occurrences of lonsdaleite in sediments dating to approximately 12,900 years ago. Thus far, to the best of my knowledge, no unquestionable lonsdaleite of impact origin has been found in association with the beginning of the Younger Dryas. With the invalidation of the supposed lonsdaleite finds, one of the strongest lines of evidence supporting the Younger Dryas impact hypothesis has evaporated. Furthermore, it needs to be pointed out that various studies have demonstrated that nanodiamonds per se (as opposed to lonsdaleite) "do not provide unique evidence for a Younger Dryas impact" event (Tian et al. 2011, 1; see also Daulton et al. 2010; van Hoesel et al. 2012).

Other evidence put forth to support the Younger Dryas impact hypothesis has not fared any better, as discussed by Boslough et al. (2012; see also Pinter et al. 2011, and Holliday et al. 2014). Here I mention a few pertinent points. Much has been made of "black mat" layers in the geological and archaeological record that, it is claimed, mark precisely the start of the Younger Dryas and contain evidence of an extraterrestrial impact (such as magnetic grains containing iridium, glass-like carbon containing nanodiamonds, carbon spherules, and so forth) and its associated effects, such as widespread wildfires (Firestone et al. 2007; Haynes 2008). However, it has been demonstrated that many of these black mats are time-transgressive (that is, they do not all belong to a single point in time; Boslough et al. 2012, 20) and black mats are commonly found in ancient wetland deposits of various ages, not just those marking the beginning of the Younger Dryas. In a study of black mats that ranged from 6,000 years old to 40,000 years old, various supposed impact markers were found, "suggesting that elevated concentrations of these markers arise from processes common to wetland systems, and not a catastrophic extraterrestrial impact event" (Pigati et al. 2012, 1; see also van der Hammen and van Geel 2008). Furthermore, certain carbonaceous spherules were found to be the result of fungus, not a comet or other impactor (Scott et al. 2010). Interestingly, and again arguing against the impact hypothesis, a carbon microspherule collected by A. West (the second author on the Firestone et al. 2007 paper) from one of the supposed Younger Dryas lower boundary sites was independently radiocarbon dated to just 207 +/− 87 years BP, rather than the circa 12,900 years ago as should have been the case if it really was from the base of the Younger Dryas (Boslough et al. 2012, 23). This just points up the problematic issues with the chronology and dating of the sites used to support the Younger Dryas impact hypothesis (see also van Hoesel et al. 2014, and Holliday et al. 2016).

The evidence from the geological and archaeological sites upon which the comet/asteroid proponents rely was put to the test by D. Meltzer et al. (2014, E2162) who concluded: "Only 3 of the 29 sites fall within the temporal window of the YD onset as defined by YDIH [Younger Dryas Impact Hypothesis] proponents. The YDIH fails the critical chronological test of an isochronous event at the YD onset, which, coupled with the many published concerns about the extraterrestrial origin of the purported impact markers, renders the YDIH unsupported. There is no reason or compelling evidence to accept the claim that a cosmic impact occurred . . . and caused the Younger Dryas."

In yet another article, titled "Bayesian chronological analyses consistent with synchronous age of 12,835–12,735 Cal B.P. for Younger Dryas boundary on four continents" (J. P. Kennett et al. 2015), the authors claim to provide evidence supporting the impact hypothesis, but this is extremely problematic. For the sites analyzed, supposed evidence of an ET object has been questioned or discredited. Even the purported synchrony is questionable as one can take issue with the appropriateness of applying Bayesian analyses to the dataset (Bayesian analysis is a particular type of statistical analysis that can be misapplied, leading to incorrect conclusions; and see Boslough et al. 2015). The authors attempt to link the start of the Younger Dryas to a platinum (Pt) anomaly in a Greenland ice core (Petaev et al. 2013) that might indicate an ET object. The Pt anomaly could have resulted from volcanic activity; the Laacher See super-volcano (Germany) exploded around 12,900 years ago (Petaev et al. 2013). If the Pt anomaly does indicate an ET object, it may have been localized (e.g., a relatively small meteorite), non-cataclysmic, and unconnected to the Younger Dryas triggering event (Boslough 2013).

J. Wittke et al. (2013) argued that "10 million tonnes" of "impact spherules" were scattered across four continents by a fragmented comet or asteroid at the beginning of the Younger Dryas; however, it was subsequently demonstrated that at least some of these supposed "impact spherules" were of ancient human origin (for instance, siliceous scoria droplets produced when buildings were destroyed in fires) and furthermore they do not all date to the start of the Younger Dryas (Thy et al. 2015). Indeed, dating is absolutely critical to an impact hypothesis—all of the evidence should date to the same point in time (it should be "isochronous").

Another argument against the impact hypothesis is that no crater (or craters) has yet been definitively identified as dating to circa 12,900 years ago. Such a crater would be very recent geologically, and arguably should therefore remain relatively fresh and evident. It has been suggested that the impactor may have exploded in the atmosphere, breaking up into numerous fragments that cratered ice sheets, which subsequently melted (thus destroying the crater evidence). Possibly there is evidence of craters under the Great Lakes or Hudson Bay. Or perhaps the elliptical depressions known as the Carolina Bays found on the Atlantic Coastal Plain of the United States were created by the impacts (Firestone et al. 2007), but the dating of the Carolina Bays is questionable and not firmly linked to the beginning of the Younger Dryas. Indeed, based on the best evidence, the majority of the Carolina Bays landforms are much older than the supposed impact of circa 12,900 years ago (Holliday et al. 2014). The 1908 Tunguska explosion of an incoming extraterrestrial object over Siberia flattened a widespread area of forest without leaving a crater (see Schoch with McNally 2003). Could a much larger explosion and fragmentation of an incoming object, an explosion that was a million or more times larger than the Tunguska event (this is what is theoretically involved, according to Firestone et al. 2007), have occurred at the beginning of the Younger Dryas? Boslough et al. (2012) analyzed this possibility and found it highly unlikely, concluding that "consideration of basic laws of physics indicate that such a fragmentation or high-altitude airburst event would not conserve momentum or energy, would lie outside any realistic range of probability, and therefore did not occur during the YD [Younger Dryas] as described by Firestone et al. [2007]" (Boslough et al. 2012, 24; see also Boslough et al. 2013).

After a thorough review of the Younger Dryas Impact Hypothesis (YDIH), Holliday et al. summarize their conclusions as follows:

> In summary, the data and the hypotheses generated by YDIH proponents contain errors of fact and errors of omission, and are contradictory, inconsistent and incoherent. Much of the evidence used to support the idea is unfounded assertion and the corollary hypotheses are demonstrably false. Further, the published assertions are based on a lack of understanding of basic principals [sic, principles] of Quaternary geology, of the well-established geochronologic records at sites and locality, of the records of North American Paleoindian archaeology and late Pleistocene extinction, and of the physics of hypervelocity impact processes. The YDIH is poorly supported on the basis of data published by those on both sides of the debate and proponents rarely consider alternative hypotheses in interpreting those data. (Holliday et al. 2014, 527)

IF NOT AN IMPACT, THEN WHAT?

At this point, in my assessment, the evidence collectively points away from an extraterrestrial impact for the start of the Younger Dryas, but the issue of what exactly did trigger the onset of the Younger Dryas is unresolved. There remains evidence put forth of an unusual event at this time. For instance, M. I. Petaev et al. (2013) report a platinum anomaly in a Greenland ice core that spans the beginning of the Younger Dryas. However, they offer no definitive conclusions as to what could have caused such an anomaly—whether extraterrestrial or terrestrial (such as a volcanic eruption).

The onset of the Younger Dryas remains somewhat of a mystery. As seen in the ice cores and sediment profiles, it was abrupt (Steffensen et al. 2008). But the changes that mark the beginning of the Younger Dryas "were not everywhere of the same severity, or in the same direction" (Fiedel 2011, 262). The Younger Dryas as a cooling event was primarily a Northern Hemisphere phenomenon. In some places, due apparently to shifts in atmospheric and oceanic circulation patterns, the Younger Dryas was wet rather than dry (cold and dry being the predominant condition in the Northern Hemisphere). In the Southern Hemisphere, such as the southeast Atlantic, New Zealand, parts of South America, and Antarctica, the Younger Dryas was a period of warming, sometimes referred to as the “bipolar seesaw response” (Carlson 2013, 129; Carlson 2010). Still, there was greater cooling in high northern latitudes (by up to 10°C in Greenland relative to the previous period, or about 15°C colder than modern temperatures; Fiedel 2011, 262) than the warming in the southern latitudes, resulting in an overall net global cooling during the Younger Dryas of approximately 0.6°C (Shakun and Carlson 2010; Carlson 2013, 129).

Suggestions as to the cause and/or triggering mechanism behind the onset of the Younger Dryas have generally fallen into several broad categories, including: (1) changes in oceanic circulation; (2) changes in atmospheric circulation; (3) changes in atmospheric carbon dioxide concentrations; (4) changes in surface albedo; (5) volcanic activity; (6) external “forcing events” such as an extraterrestrial impactor (discussed above), a supernova that could generate an interstellar shock wave and wave of debris, causing perturbations to the atmosphere-Earth system (Firestone et al. 2006; see comments in Boslough et al. 2012, 15), or various other forms of cosmic radiation or “cosmic dust”; and (7) changes in solar radiation (Fiedel 2011; Renssen et al. 2000). Of course, these various factors are not necessarily mutually exclusive, and indeed one triggering mechanism may have caused other events to take place, the combined results of which initiated the Younger Dryas.

During the last couple of decades, among geologists and paleoclimatologists; it appears that the most widely accepted explanations have involved changes in oceanic circulation patterns, particularly involving changes in thermohaline circulation in the North Atlantic (Renssen et al. 2000) and slowing of the Atlantic meridional overturning circulation (Carlson 2010), associated with concomitant atmospheric and climatic changes. Key to most such theories is an influx of cold freshwater into the North Atlantic preventing the uprising or upwelling of warm salty water from the southern oceans, thus shutting down the overturning of ocean water, with the result that the atmosphere over the ocean would remain cool rather than being warmed as it previously had been due to the upwelling of warm water (Fiedel 2011). What caused the influx of freshwater, according to such scenarios? The major suggestions are the melting of the Laurentide ice sheet of eastern Canada and the release of freshwater from Lake Agassiz (a huge ancient lake that formed due to the retreating ice sheet; it covered portions of Saskatchewan, Manitoba, and Ontario) that spilled massive amounts of water into the North Atlantic. However, modern dating of the timing of a massive discharge of water from Lake Agassiz does not correspond to the onset of the Younger Dryas (Carlson 2010); it may be a thousand years too late (Fiedel 2011, 263). Thus, another mechanism needs to be found for the triggering of the Younger Dryas.

SOLAR ACTIVITY

An important clue may be this: at the onset of the Younger Dryas a sudden increase in ^{14}C concentrations is observed. It has been suggested, although I believe unconvincingly, that this could be due to CO_2 changes in the atmosphere due to changing surface ocean temperatures modulating the amount of CO_2 absorbed by the oceans (Fiedel 2011). Another explanation is that the Sun (and possibly also Earth’s magnetic field) weakened, allowing the greater penetration of cosmic radiation into our atmosphere, thus creating more ^{14}C (Fiedel 2011; Renssen et al. 2000; cosmic rays can transform ^{14}N to ^{14}C). Renssen et al. (2000) have argued the case that reduced solar activity could have initiated the onset of the Younger

Dryas. They propose two mechanisms by which this could possibly occur: (1) a reduction in solar ultraviolet radiation would entail a reduction in stratospheric ozone production and attendant changes in atmospheric circulation patterns, ultimately resulting in a cooling effect on the surface of our planet in mid to high latitudes; and (2) reduced solar activity allowed more cosmic rays to penetrate our atmosphere, promoted aerosol formation and cloud nucleation, and resulted in more cloud cover globally with increased reflection of incoming solar radiation, thus cooling Earth.

While there may have been overall reduced solar activity during the Younger Dryas, LaViolette (2011; see discussion in Schoch 2012, 114–118) has suggested that there may have been a solar proton event (SPE; this acronym is also used to refer to a "solar particle event," which is basically the same thing as a solar proton event), during which protons were accelerated by the Sun to incredibly high energy levels and penetrated our atmosphere at the start of the Younger Dryas. It is now understood that even when the background activity of the Sun is relatively low, major solar outbursts can occur (for instance, the Carrington Event of 1859 occurred during an overall relatively quiet solar cycle; see Schoch 2012, 186–191). LaViolette (2011) dates the Younger Dryas event, which is the focus of his paper, to 12,837 +/− 10 calendar years BP, which places it at just about 12,900 years ago; that is, at the beginning of the Younger Dryas (indeed, converting it to a b2k date of 12,887 +/− 10 years ago, it is virtually identical to the date for the beginning of the Younger Dryas, 12,896 b2k, cited by Hoek 2008). A possible SPE at the start of the Younger Dryas provides further evidence, in my opinion, that our Sun was going through a volatile, erratic phase. An SPE may have ionized the atmosphere, increasing cloud cover, and initiated a cooling spell (Schoch 2012, 299). Then, I suspect, the Sun went into a period of reduced activity, essentially a partial shutdown, for 1,200 years.

Subsequently, as I have argued elsewhere (see discussion in Schoch 2012), our Sun "woke up" and erupted with a mighty outburst—or perhaps a series of closely spaced outbursts—circa 9700 BCE, thus terminating the Younger Dryas cold spell and literally snapping us out of the last ice age. Stars go through cycles of activity and inactivity, and after all our Sun is simply another star (see Pugh et al. 2015). As we have discussed above, the end of the last ice age can be located in the Greenland ice record within not just a year, but virtually to the month, week, and perhaps even day. What could conceivably cause such a major and abrupt warming and climatic reorganization? In my assessment, the isotope and geochemical data, sediment data, and archaeological evidence (such as ancient petroglyphs; see Peratt 2003) all converge to corroborate the theory that a major solar outburst ended the last ice age (Schoch 2012). (I should point out that some researchers might suggest the alternative of an extraterrestrial object. I do not believe the evidence is compatible with a comet, meteor, asteroid, or other bolide hitting Earth at the end of the Younger Dryas. Furthermore, an impact or atmospheric explosion would most likely inject dust and debris into the atmosphere, which would have a cooling effect on the climate rather than a dramatic, virtually overnight, warming effect. Even an impactor hitting an ocean would not cause such sudden and sustained warming.)

In summary, I am convinced that, based on the current evidence, a very strong case can be made that the last stages of the last ice age, the onset and termination of the Younger Dryas, are linked to solar activity. Overall reduced solar activity, perhaps accompanied by an SPE, caused the initiation of a cold period 12,900 years ago. A major solar outburst ended the Younger Dryas, bringing the last ice age to a final close, circa 9700 BCE.

GÖBEKLI TEPE AND AN EARLY CYCLE OF CIVILIZATION

The climatic changes and solar activity of the last millennium and a half of the last ice age had profound effects on the human populations of the time. I have made the case that an early cycle of advanced civilization arose before the end of the last ice age—thousands of years prior to the conventional date for the origin of civilization, circa 4000 BCE to 3000 BCE (see Schoch 2012). Dramatic proof of this earlier period of civilization is the incomparable archaeological complex of Göbekli Tepe in southeastern Turkey (Schmidt 2011, 2012), the earliest portions of which, as I will argue below, predate the end of the last ice age (see also Schoch 2012). Göbekli Tepe exhibits signs of destruction and rebuilding, and what appear to be fortifications (the building of crude stone walls around and between the earlier erected and magnificently carved pillars), immediately postdating the end of the last ice age.

Fig. A9.1. Robert Schoch at Göbekli Tepe in 2010.(Photograph by Catherine Ulissey.)

In Enclosure D of Göbekli Tepe there is a “wall plaster” composed of “loam, which also contains small amounts of organic material” (Dietrich et al. 2013, 36). A sample of this plaster was radiocarbon-dated, yielding an age of 9745 to 9314 BCE (“calBC at the 95.4% confidence level”; see Dietrich et al. 2013, 36). Subsequent dated samples from Enclosure D are in “good agreement” with this date (Dietrich et al. 2013, 37). This is arguably the most accurate date to come from the earliest portions thus far excavated at Göbekli Tepe. However, it is not the date of initial construction of this portion of Göbekli Tepe (that is, the erection of the pillars of Enclosure D). This radiocarbon date is from wall plaster on a wall that is secondary—a wall that was erected after the initial structure consisting of T-shaped pillars arranged in a Stonehenge-like fashion was built—and furthermore, it is not inconceivable that this wall may have been plastered and subsequently replastered (perhaps more than once), as we commonly observe in ancient structures of later periods.

Based on the evidence, and incorporating archaeoastronomical analyses, I believe that the pillars of Enclosure D, including the two central anthropomorphic pillars, were erected by circa 10,000 BCE (Schoch 2012, 53–57). This would date this stone circle and pillars to a time before the end of the last ice age (before 9700 BCE), thus placing them in the Younger Dryas. Interestingly, in a 2003 paper Pustovoytov and Taubald suggested, on the basis of reconstructed paleoenvironments using stable carbon and oxygen isotopes from pedogenic carbonates of Göbekli Tepe, that at least the oldest portions of Göbekli Tepe date back to the Younger Dryas. They wrote, “. . . of prime importance appears to be the fact that the early laminations of pedogenic carbonate at Göbekli Tepe recorded *in situ* isotopic signals distinctly different (relatively cool and dry environments) from those of most of the first half of the Holocene [the time since the end of the last ice age]. Considering that secondary carbonate started to accumulate once the PPNA [Pre-Pottery Neolithic A] stone enclosures were covered by fill, it is evident that the builder[s] of the enclosures should have experienced the harsh climatic conditions of the Younger Dryas" (29; italics in the original, comments in brackets by R. Schoch). In a later paper, however, Pustovoytov (2006) no longer mentions a possible Younger Dryas age for some of the Göbekli Tepe structures.

Enclosure D was subject to damage that resulted in some of the pillars being knocked over and broken in ancient times. This may have occurred during the turmoil at the end of the last ice age and shortly thereafter. Various pillars were reerected, and in some cases realigned and reworked. Relatively crude stone walls were built between, among, and around the pillars, forming circles or "spirals" of stone walls; in some cases these secondary stone walls cover over older bas-reliefs (Schmidt 2012; Schoch 2012). Some of these walls were plastered; as noted, in the case of Enclosure D a radiocarbon date for some of this later plastering is 9745 to 9314 BCE (Dietrich et al. 2013), which places this secondary stone wall in a transitional period between the end of the last ice age and fully post–ice age times.

Thus at Göbekli Tepe we have direct evidence of an earlier cycle of civilization, one before the traditional "origin" of civilization some 6,000 years or so later in Mesopotamia, Egypt, and the Indus Valley. Other evidence for this early cycle of civilization comes from Egypt (for example, the redating of the core body of the Great Sphinx—the head is a dynastic recarving—to the end of the last ice age; see Schoch 2012). Likewise, in 2010 at the archaeological site of Wadi Faynan in southern Jordan a 22-meter by 19-meter amphitheater-like structure was found dating to circa 9700 BCE (Simmons 2014). Returning to Göbekli Tepe, here we see direct evidence, in the form of toppled and reerected pillars followed by hastily built secondary walls, of the cataclysmic events that accompanied the end of the last ice age. Ultimately, the early ice age civilizations suffered mighty setbacks and collapsed.

It should also be pointed out that the synchronicity of the major extinction of Pleistocene mammals in North America has been demonstrated (the best analyses of the data indicate that the extinctions most likely all occurred at the same time geologically; Faith and Surovell 2009), and it occurred at the very end of the last ice age—that is, at the end of the Younger Dryas, circa 9700 BCE. Analyzing the work of Faith and Surovell, and in particular their Figure 1, it is evident that the major cluster of extinctions occurs at circa 9700 BCE (which they label as "10,000" radiocarbon years B.P.) and not at the start of the Younger Dryas (circa 10,900 BCE).

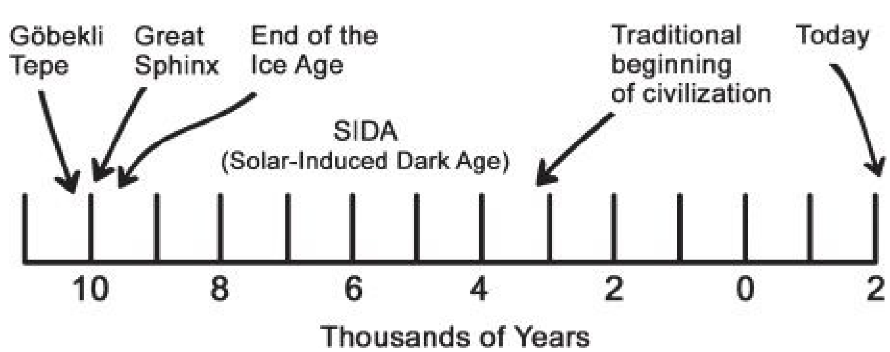

Fig. A9.2. Timeline of civilization from the end of the last ice age to the present. (Courtesy of R. Schoch and C. Ulissey.)

The events that ended the last ice age, and devastated this early cycle of civilization, were triggered by a major solar outburst (Schoch 2012). As my wife, Catherine Ulissey, first referred to it, the subsequent “solarinduced dark age” (or SIDA for short; it can also stand for “subsequent to the ice datum age”) lasted from about 9700 BCE until the full reemergence of civilization during the period of circa 4000 BCE to 3000 BCE. By acknowledging this early cycle of civilization, dating back to the end of the last ice age (currently best exemplified by the earliest portions of Göbekli Tepe), we add an entirely new chapter to the history of humanity.

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FOOTNOTES

*1. The term gateway to the stars was coined by the BBC in their 1994 documentary The Great Pyramid: Gateway to the Stars (BBC2 1994), based on my book The Orion Mystery; see http://bufvc.ac.uk/dvdfind/index.php/title/9012. (Accessed August 24, 2016)

*2. The apartment belongs to Mohamed Nazmy, president of Quest Travel.

*3. I would sometimes stay at Gouda's to share breakfast with him and one of his tenants, the New Zealand photographer Joanne Cunningham. Joanne had resided at the Sphinx Guest House since 2002. In 2009 she returned to New Zealand to be treated for cancer. Joanne passed away on September 24, 2013.

*4. When I worked in the Sultanate of Oman in 1973, I advised our client, the Ministry of Defense, that time and money would be saved to reposition a housing project some one hundred meters away from an area that had a mound in the center. Since the project was in an open desert region, there were no constraints to do this.

*5. These are text-inscribed royal pyramids of the Fifth and Sixth Dynasties at Saqqara. They are essentially magical recitations for the rebirth rituals of kings.

*6. The pyramid blocks are rarely more than 25 tons, with most averaging only 2.5 tons.

*7. It is illegal to climb the pyramids without specific permission from the Antiquities Ministry. I have been twice to the top, in 1995 and 1999, with special permission from Zahi Hawass.

*8. Most Egyptologists call them solar boats, apparently intended for the king to navigate in the sky world. Others, however, think they may have just served the ceremonial purpose of transporting the body of the mummified king from his palace to the necropolis.

*9. Unfortunately, after the 2011 Revolution, the Egyptian Ministry of Antiquities was unable to fully stop clandestine explorations. In early 2015 the antiquities police stumbled on several illegal excavations by local residents. One such excavation was a deep tunnel leading apparently to the causeway and Valley Temple of Khufu.

*10. A cartouche is an oval hieroglyph sign in which the name of a king or queen is inscribed. The term cartouche was coined by the French soldiers during the Napoleonic occupation of Egypt because it reminded them of the shape of a gun cartridge (cartouche in French).

*11. The beard fragment must have broken into two pieces, as can today be seen in the display at the British Museum. At least three more fragments were left near the Sphinx and are today in the Cairo Museum.

†12. Hawass disagrees with this, and argues that if Tuthmoses IV had the resources to free the Sphinx from the encroaching sand, then he also must have had the resources to bring the granite from the quarries of Aswan, some nine hundred kilometers away.

*13. This was reported by a few European visitors in late 1817 and early 1818.

*14. Earl Mountnorris was George Annesley, previously called the ninth Viscount Valentia from 1793 to 1816. Back in 1802 Salt had been appointed secretary and draughtsman to Viscount Valentia. They went together on an eastern tour to India, and on the return trip Salt explored the Red Sea areas and Ethiopia, then returned to England in 1806. Salt's paintings were published in 1809 in Viscount Valentia's *Voyages and Travels to India*. Salt returned to Ethiopia in 1809 and then went to Egypt in 1816 as British consul, where he remained until his death near Alexandria in 1827. Salt's huge collection of Egyptian antiquities, more than one thousand objects, was sold to the British Museum in 1835.

†15. It is the artist Max Weidenbach who made the drawings taken from Lepsius's squeeze in Berlin.

*16. The renowned German Egyptologist and philologist Adolf Erman collated all the copies made of the Dream Stela (Breasted 1906, vol. II, 320 fn. a mentions Erman, 428–37, 1902) and seems to have agreed with Breasted that Lepsius's drawing was the most reliable.

*17. We have discussed the location and astronomical alignments of these "sacred mounds" of the "primordial temples" in appendix 4.

*18. The epithet "king's daughter" also may indicate a wife as well or even an important individual (see Leprohon 2005, 29).

*19. See Robert Temple's collation of commentaries by early travelers to Egypt in his book The Sphinx Mystery (Temple 2009, 444–505).

*20. *The History and Amours of Rhodope*, by an anonymous author and published in London. The same story was taken up again in 1844 by the author Walter Savage Landor in his five-series book collection *Imaginary Conversations*, in the first series, *Classical Dialogues*: Aesop and Rhodope, published by Taylor and Hessey in London. Interestingly, one of the publishers, John Taylor, wrote *The Great Pyramid: Why Was It Built? And Who Built It*? in 1859, which was to influence the astronomer royal for Scotland, Charles Piazzi Smyth, to go to Egypt to research the mystery of the Great Pyramid.

†21. A bit of trivia: Volney is apparently a name combining that of the author Voltaire and the town in which he lived, Ferney.

*22. Slavery was only abolished in Egypt in 1877.

*23. For an interesting discussion on the facial features of the Great Sphinx, see Francesco M. Galassi's medico-anthropological analysis (Galassi 2014).

*24. I did ask the good lady's permission to take the photograph, and she graciously agreed. Robert Schoch was also a guest speaker at the same conference.

*25. ZDF-made documentary, *Mystery in Stone*, 30:15: www.youtube.com/watch?v=jXM09sY3hhM.

(Accessed November 15, 2016)

*26. One possible exception is a small sphinx found at Abu Ruwash and assumed to represent Hetepheres II, the wife of Djedefre, but this conclusion is not accepted by some Egyptologists.

*27. In my previous book, Black Genesis: The Prehistoric Origins of Ancient Egypt, cowritten with Thomas Brophy, I presented a plethora of evidence that a black African people inhabited the Sahara in prehistoric times when it was a lush savannah and eventually migrated into the Nile Valley when the Sahara became superarid around 5000 BCE. This view is also upheld by most anthropologists and archaeologists who specialize in the Sahara's prehistory.

*28. Sirius would last be seen in the western horizon just after sunset around mid-April, after which it was seen no more until it reappeared just before sunrise in late June. During its period of invisibility, it was below the horizon (i.e., in the "underworld").

†29. Assuming each sign/constellation to be of equal size, which of course in the real sky, they are not. The "canonical" period for a full precessional cycle through all of the signs is 25,920 years, although in reality it varies somewhat from cycle to cycle.

*30. I undertook an expedition to Gebel Uwainat in 2008 with my colleague Thomas Brophy, Ph.D., to see the rock art and vestiges of these lost people who lived there some eight thousand years ago (see Bauval and Brophy 2011).

*31. An astronomical connection can be made with an important solar festival for Horus of Behdet and the Great Sphinx, and the causeway and the position of the Valley Temple; this will be discussed in chapter 5.

*32. For an explanation as to why west was thought to be to the right in ancient Egypt, rather than left, as it is mostly seen in modern days, see here.

*33. Interestingly, the number 121 is found painted in red ochre behind the "door" at the end of the southern shaft of the Queen's Chamber of the Great Pyramid. This number, 121, is the square of the prime number 11, which is extensively used in the geometry of the Great Pyramid. Also the number 363 is 360 + 3. The Egyptian civil calendar had 360 days plus five extra days called the epagomena (the "days upon the year"). During those five days Egyptians were warned to be watchful of lurking dangers. On these days the five major deities were said to have been born: Osiris, Horus, Seth, Isis, and Nephtys. The third epagomenal day was the "birth of Seth."

*34. For more on Horus names, see the doctoral thesis by Randy L. Shonkwiler (Shonkwiler 2014, 7–20).

*35. The zenith of the sky is directly above an observer (+90º altitude). In Egypt the sun will be at zenith only if you are standing on the Tropic of Cancer (near Aswan) at noon at the summer solstice. At Giza it will always be in the southern sky with a maximum 84º altitude at summer solstice.

†36. In the Western world we are accustomed to perceive north as being "up." When we take a journey north we say that we are "going up north"; when traveling south we say we are "going down south." This concept began in the seventeenth century, when Western cartographers decided to place north at the top of their maps. But any other direction, of course, can be considered to be up. Indeed, medieval European cartographers placed east as up to direct themselves toward Jerusalem, and Arab cartographers placed south as up on their maps, probably because it was the way the Chinese

did it.

*37. The ancient Egyptians called the Nile River *iterw*, as distinct from the Inundation, which was personified as Hapi.

*38. On the throne of Khafre there is the same motif, but here only the symbols of the lotus plants of the south (Upper Egypt) and the papyrus plants of the north (Lower Egypt) are depicted. The Nile Inundation, however, may be implied.

*39. As my coauthor, Robert Schoch, likes to point out, this is not necessarily the case, depending on how one views the situation. If one goes by the actual constellations in the sky, then not all zodiacal signs are the same size and therefore sidereally not all precessional ages are of the same length/duration. Yes, many people simply divide the "great year" of precession by twelve to get twelve equal ages, but this is questionable. Also, the length of a great year varies from one cycle to another, and the speed is not constant within a cycle, so it is not always 2,160 years per sign, even if one simply uses signs of equal length.

*40. Interestingly, the Inundation season was also called Akhet, which means "horizon."

*41. For an explanation as to why west was thought to be to the right in ancient Egypt, rather than left, as it is mostly seen in modern days, see here.

*42. Translated by Natalie Beaux (Beaux 1994b, 66).

*43. For an explanation as to why west was thought to be to the right in ancient Egypt, rather than left, as it is mostly seen in modern days, see here.

*44. I have never met Krupp in person, although we did correspond briefly in 2000–2002.

†45. It was followed in March 2001 by another article titled "The Sphinx Blinks."

‡46. www.youtube.com/watch?v=5waZz7HK0_0. (Accessed November 15, 2016)

*47. Krupp admitted that: "I first detected *logical conflicts* in *The Orion Mystery* in 1995, when I was writing *Skywatchers, Shamans, & Kings: Astronomy and the Archaeology of Power*, and I described one of those contradictions—directional inversion—briefly in a section about pyramids in that book" (italics added). Krupp's *Skywatchers, Shamans, & Kings* was first published in 1997. But by his own admission Krupp took a special interest in *The Orion Mystery* when it came out in 1994. So what happened between 1994 and 1997? I propose that the simple and most obvious answer to this was the creation of the CMI by Krupp and his CSICOP colleagues.

*48. This is from a transcript of the BBC, which was supplied to me by the BBC Horizon editor upon request by my solicitor.

*49. For an interesting discussion on this issue, see Bauval 2000.

*50. Bettina Lerner was senior editor at the BBC's Horizon program, which produced Atlantis Reborn.

*51. The full story of this "BBC Horizon scandal" can be seen here: www.grahamhancock.com/horizon/. (Accessed November 15, 2016)

*52. Sadly, Fairall is not available to comment, as he drowned in a tragic diving accident off the coast of Cape Town in South Africa on November 23, 2008.

*53. I was living in England in July 2002 when this particular debate with Krupp was ongoing. A good friend who lives in Paris, Claude Commander, offered to go to the Louvre Museum on my behalf to take photographs of the Dendera Zodiac.

*54. See www.hallofmaat.com/index_p.php?0. (Accessed November 15, 2016)

*55. British Egyptologist David Jeffreys has also shown that there was an alignment relationship between some of the pyramid sites located on these mounds and the temple-city of Heliopolis (Jeffreys 2007).

*56. This was pointed out in 2006 in my book *The Egypt Code*, where I wrote, “Measuring from a scaled map of the Memphite Necropolis, it is obvious that Djedefre’s pyramid is nearer 27º south-of-west of Heliopolis. At this latitude this is the orientation of the setting sun at the winter solstice” (Bauval 2006, 71). The same idea was “borrowed” in 2007 by the Spanish astronomer Juan Belmonte, who, along with his coauthors, wrote, “There [at Abu Ruwash], the pyramid of Djedefre was built on top of a rocky outcrop that in antiquity would have been clearly visible from Heliopolis. As a matter of fact, sunset at the winter solstice” (Belmonte, Shaltout, and Fekri 2009). Belmonte did not credit me, although he surely was aware of the precedent since my book *The Egypt Code* in listed in his bibliography!

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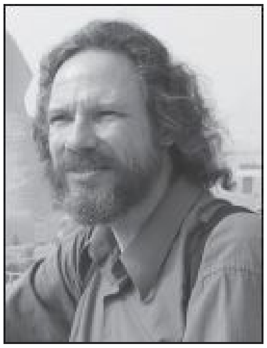
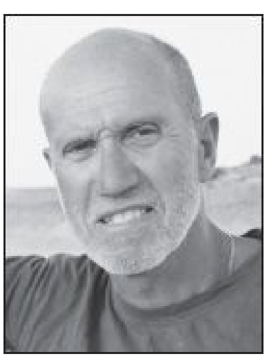
ABOUT THE AUTHORS



Robert M. Schoch, Ph.D., a full-time faculty member at Boston University since 1984, earned his Ph.D. (1983) in geology and geophysics at Yale University. In the early 1990s, Schoch stunned the world with his geological analysis of the Great Sphinx of Egypt, demonstrating that the monument, as well as the walls of its enclosure, bears the scars of extreme water weathering and erosion. As Egypt has known hyperarid climatic conditions for the past five millennia, Schoch concluded the monument traces its origins to an earlier (pre-Sahara) epoch and a previously unidentified civilization, thus throwing a major monkey wrench into the orthodox view of the rise of civilization. Schoch's courageous assertions of decades ago have been confirmed with the discovery of the astoundingly sophisticated 12,000-year-old megalithic complex of Göbekli Tepe in southeastern Turkey. Initially placing the Great Sphinx in the period of circa 7000–5000 BCE, thousands of years earlier than its standard attribution of circa 2500 BCE, new data and discoveries have led Schoch to now push the monument back to the end of Earth's last ice age, a glacial period brought to a close by massive solar events (ca. 9700 BCE).

Schoch's career and interests extend beyond strict geology and geophysics—to anthropology (in which he earned a B.A. at George Washington University), environmental science (he is a coauthor of the university textbook, *Environmental Science: Systems and Solutions*), and biology/paleontology (a genus of fossil mammals is named after him in honor of his graduate research). Schoch is the author of numerous books and articles both technical and popular that have been translated into multiple languages, including *Forgotten Civilization: The Role of Solar Outbursts in Our Past and Future* (Inner Traditions, 2012). He has reached audiences around the world via television, radio, live presentations, and the Internet. (The Emmy-winning documentary *The Mystery of the Sphinx*, which first aired on NBC, remains a favorite among audiences.) In acknowledgment of his scientific contributions to the study of ancient civilizations, in 2014 Schoch was awarded the title of Honorary Professor of the Nikola Vaptsarov Naval Academy in Varna, Bulgaria. Schoch and his wife, Catherine Ulissey, travel the world in their pursuit of a deeper understanding of humanity's past. Schoch's website is: www.robertschoch.com.



Robert Bauval was born in Alexandria, Egypt, in 1948. His mother was Maltese and his father Belgian-Italian, with ancestries in Egypt that go back to pre-Napoleonic days in 1785. Bauval was educated at the British Boys School and Victoria College in Alexandria. He left Egypt in 1967 and went to England, where he continued his studies at the Franciscan College in Buckinghamshire. In 1973 he obtained a higher national diploma in building management with distinction from London South Bank University and a postgraduate diploma in European marketing with distinction from the University of Buckingham. He is fluent in English, French, Italian, and Arabic, and also speaks some Spanish. He worked as a building engineer in England, the Sultanate of Oman, Iran, Sudan, Guinea, Ivory Coast, Saudi Arabia, and France.

In 1983 Bauval developed a theory that correlates the three pyramids of Giza with the three stars of Orion's Belt (known internationally as the Orion correlation theory, or OCT for short) and, with the support of Egyptologist Sir I. E. S. Edwards, published a paper in the *Oxford Journal Discussions in Egyptology* in 1989. In 1994 Bauval published his first book, *The Orion Mystery* (with Adrian Gilbert), which was a number one bestseller in the United Kingdom and also an international bestseller that was translated into more than twenty-five languages. He coauthored and authored several other bestsellers: *Keeper of Genesis* (1996), *Secret Chamber* (1999), *Talisman* (2004), *The Egypt Code* (2006), *Black Genesis* (2011), *Breaking the Mirror of Heaven* (2012), *The Master Game* (2012), *Imhotep the African* (2013), *The Vatican Heresy* (2014), *Secret Chamber Revisited* (2014), and *The Soul of Ancient Egypt* (2015). Bauval is currently working on a book with the astrobiologist Professor Chandra Wickramasinghe. Bauval has appeared on many national and international television channels, including BBC, ABC, NBC, Fox-TV, CNN, RAI, the History Channel, National Geographic, the Discovery Channel, FRANCE A3, and Channel 4 UK. Bauval lives with his wife, Michele, in southern Spain, near Malaga. They have two children, Candice and Jonathan, who live in England.

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