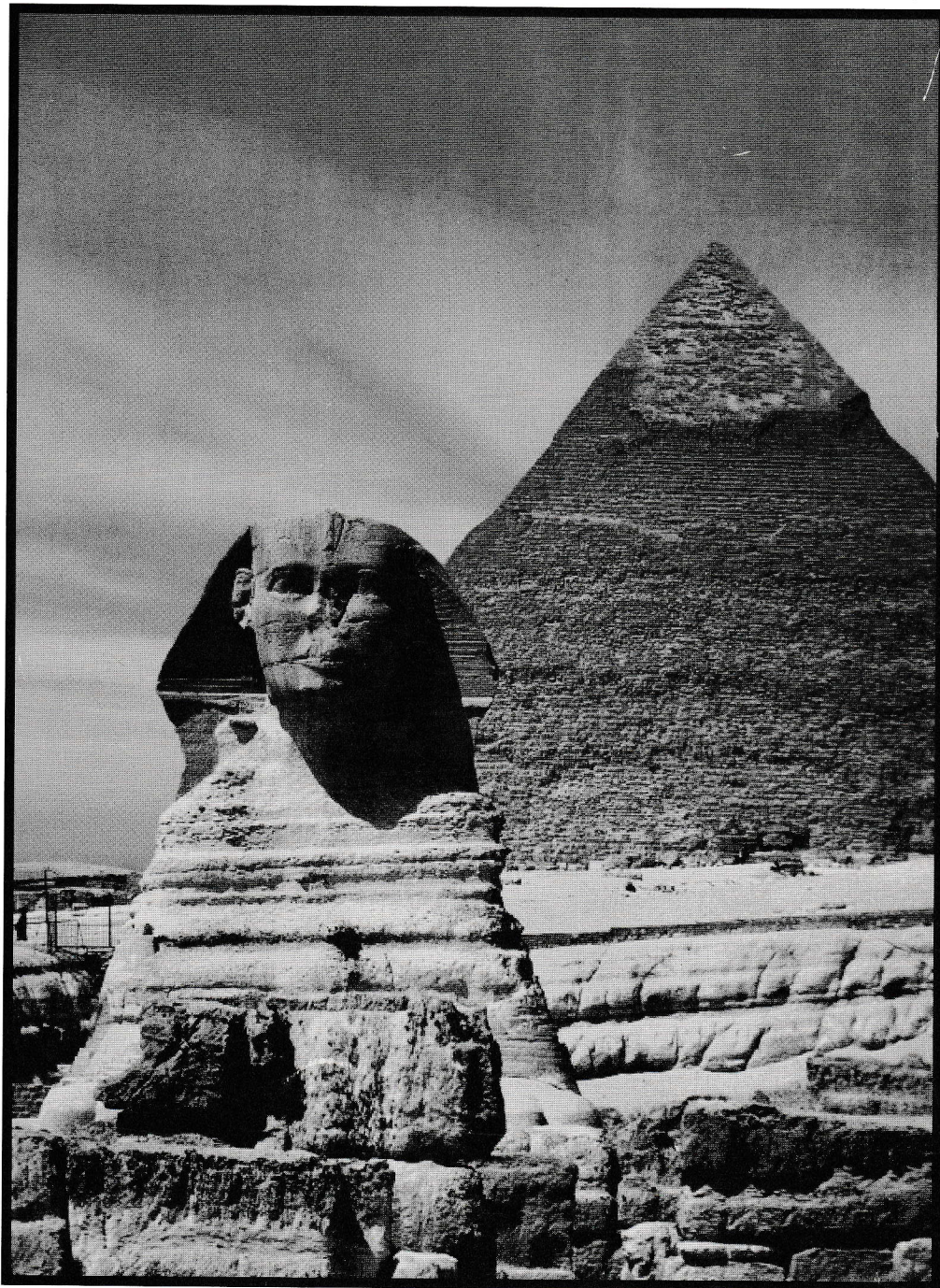


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# Giza Before the Fourth Dynasty

*There has been a great deal of debate about the age of the Great Sphinx of Giza, much of which has focussed on the weathering of the limestones from which the Sphinx was excavated.<sup>1</sup> This debate tends to have focussed on the Sphinx itself without addressing the wider implications of an early Sphinx for the Giza necropolis or ancient Egyptian history in general. It is geologist Colin Reader's view that the evidence provided by the weathered and eroded limestone rocks at Giza clearly indicates that the Sphinx pre-dates the 4th Dynasty. However, rather than suggesting that the early Sphinx is an isolated relic of a long-lost culture, without context or provenance, the geo-archaeological investigations of Giza are beginning to lift the veil on a little-appreciated Early Dynastic origin for the site.*

## COLIN READER

With few exceptions,<sup>2</sup> standard Egyptological texts state that the Great Sphinx of Giza was built during the reign of Khafre (fourth ruler of the 4th Dynasty, OC – c. 2520-2494 BC). Over the last decade, however, much has been said and written to challenge this orthodox date, with some of the more credible articles focussing on the evidence provided by the limestones from which the Sphinx has been excavated. After over five years of research, it is my conviction that the geological evidence is not consistent with the attribution of the monument to Khafre or, for that matter, to any other pharaoh of the 4th Dynasty.

In this paper, I will explore both the case for the attribution of the Sphinx to Khafre and some of the alternatives. In this latter group, I include my own theory which, I hope to demonstrate, goes further than any other in reconciling the available evidence.

### The Sphinx and its setting

As a monument of ancient Egypt, the Great Sphinx of Giza is unique. At over seventy metres long and twenty metres high, the Sphinx was hewn out of the limestone bedrock which extends across much of this part of the greater Cairo area. With the body of a lion and the head of a man, the Sphinx has been linked to ancient solar worship.<sup>3</sup>

Across much of the Sphinx's body – particularly the lower lying parts – a veneer of masonry covers the limestone core. Much of this masonry was added during the various phases of its restoration, the first of which, or so it is argued, being undertaken during the reign of the 18th-Dynasty pharaoh, Thutmose IV (OC – 1392-1382 BC<sup>4</sup>). However, it has also been suggested that some of this masonry formed part of the original construction, in order to accurately model some of the finer detail of the lionine body.<sup>5</sup>

As shown in Figure 1 (overleaf), the Sphinx sits within a low-lying area (known as the Sphinx enclosure) which is bounded to the south and west by a high face cut into the same limestone beds from which the body of the Sphinx was excavated. To the north, the enclosure floor rises by means of a single terrace reaching up to the modern tourist road. To the east are the remains of the 'Sphinx temple'.

There are also a number of other features within the Sphinx enclosure which date from the later periods of Egyptian history – such as the temple of the New Kingdom pharaoh Amenhotep II (OC – 1427-1392 BC) and the remains of mudbrick walls built by Thutmose IV.

Although remarkable in its own right, the Sphinx is just one element of the Giza necropolis which is arguably the most famous archaeological site in the world. The three great 4th Dynasty pyramids of Khufu, Khafre and Menkaure were constructed on a north-east/south-west trending ridge which crosses the site. In addition to the pyramids, a multitude of tombs belonging to the royal family, the nobles and the courtiers were also built in a series of mastaba fields and other related cemeteries (see Figure 2).

### Attribution of the Sphinx to Khafre

There are two main arguments used to support the conventional Old Kingdom dating of the Sphinx. The first is the strong 4th Dynasty context provided by the Giza necropolis

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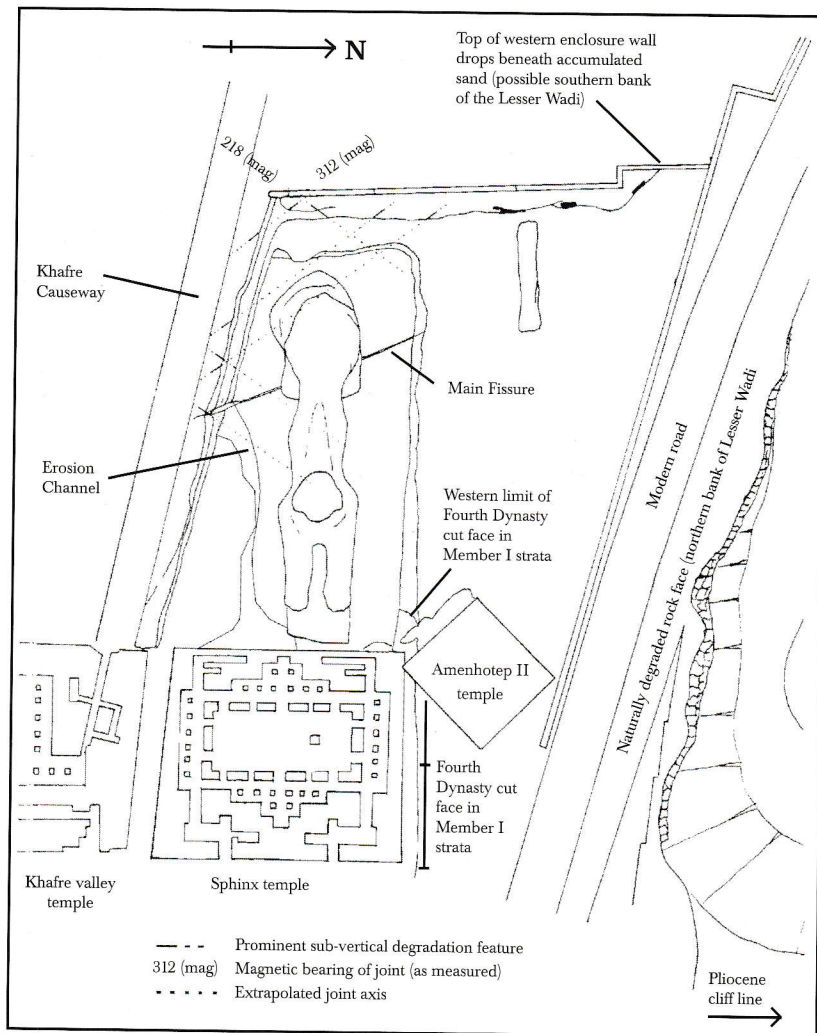


Fig. 1: Sketch plan of the Sphinx and Sphinx enclosure.

in general and, more specifically, by the adjacent mortuary complex of Khafre. In addition, there is alleged to be a reference to the pharaoh Khafre on the so-called Dream Stela, erected between the paws of the Sphinx to commemorate the restoration undertaken by Thutmose IV.

### *The location of the Sphinx*

Although not supported by some recent publications,<sup>6</sup> it has often been argued that the Sphinx was carved from a block of poor quality limestone, left-over from the quarrying of the site during the reign of Khufu. This sequence of development is favoured by the advocates of the conventional age of the rock-cut colossus as it clearly identifies the Sphinx as a post-Khufu monument. It is also common to find standard texts implying that Khafre's workmen were able to select the location of the Sphinx so that it formed a late addition to that pharaoh's mortuary complex, being placed next to both Khafre's pyramid causeway and his valley temple.

The quarry-block hypothesis assumes that original ground levels at Giza were above the level of the head of the Sphinx and that ancient quarrying had brought about a major change in the Giza landscape. Not only is this view

now rejected by a number of eminent Egyptologists,<sup>7</sup> but it is also inconsistent with the geomorphology of the site.

To the north of the Sphinx (just beyond the modern tourist road) there is a low cliff – the bank of an ancient wadi (see Figure 1).<sup>8</sup> Prior to any ancient development, this wadi cut down through the limestones of the plateau, separating the Sphinx and the areas to the south from the massif upon which the Great Pyramid of Khufu was built.

In addition to the wadi erosion to the north of the Sphinx, the areas to the south also appear to have been naturally low-lying, with original ground levels still preserved in the construction of a number of tombs.<sup>9</sup>

These surviving elements of the natural topography of the plateau clearly indicate that, in the vicinity of the Sphinx, the original ground profile was generally low lying, but rose to form a small natural hill from which the Sphinx was carved. Controlled by the topography in this way, there was little potential for the ancient builders to have 'selected' the site for the Sphinx, as many Egyptologists have argued.

### *A reference to Khafre on the Dream Stela?*

When the Dream Stela was first excavated in the early 1800's, many of the lowest lines of hieroglyphic text had been lost as a result of the weathering of the granite from which the stela was carved. On one of the surviving lower (but highly fragmented) lines of text it is alleged that the hieroglyphs *Kha-f* were present, enclosed in a broken cartouche. The presence of the cartouche identified this as the royal name Khafre. However, it has now been claimed that there was, in fact, no cartouche and that, as a consequence, this text never referred to the 4th Dynasty pharaoh who is generally credited with creating the Sphinx.<sup>10</sup> Unfortunately, as a result of further weathering, the disputed line of text has now been completely lost.

The Dream Stela was excavated by Caviglia in 1818 during his attempts to clear the Sphinx of wind-blown sand. Records of Caviglia's excavations were made by Henry Salt. However, Salt failed to publish his diaries during his lifetime and it was not until the early 1840s that part of the record of Caviglia's work was included in Howard Vyse's 'Operations Carried on at Gizeh'. Vyse's extract from Salt's diary incorporates a meticulous drawing of the Dream Stela showing the disputed line of text. This copy indisputably includes a cartouche, containing two of the three elements of the name 'Kha-f[re]'. The combination of these two hieroglyphs – the sun rising above a hill (*kha*) and the horned viper (*f*) – are unique to Khafre.

Although Vyse's publication leaves little doubt that the Dream Stela does indeed refer to Khafre, the implications for the age of the Sphinx are less easily determined. The

broken text makes no reference to Khafre as the builder of the Sphinx. In fact the text was so badly damaged that the basis for the reference to Khafre remains completely obscure. The Dream Stela does not, therefore, provide the strong case for Khafre as the builder of the Sphinx that some would argue.

Another New Kingdom stela – that of Amenhotep II – was also found within the Sphinx enclosure by Selim Hassan during his extensive excavations at Giza in the 1930s and 40s. The Amenhotep II stela is interesting for the Sphinx debate because it mentions both Khafre and Khufu – but without any apparent reference to either Old Kingdom pharaoh as its creator.

He (Amenhotep II) yoked the horses in Memphis, when he was still young, and stopped at the sanctuary of Haremakhet [i.e. the Sphinx cult centre]. He spent a time there in going round it (in his chariot) looking at the beauty of the sanctuary of Khufu and Khafre, the revered ones.<sup>11</sup>

So, the evidence for the attribution of the Sphinx to Khafre is somewhat circumstantial. This was certainly the view expressed by Selim Hassan who, in the 1946 report on his extensive clearance of the Sphinx enclosure, stated:

Taking all things into consideration, it seems that we must give the credit of erecting this, the world's most wonderful statue, to Khafre, but always with this reservation that there is not one single contemporary inscription which connects the Sphinx with Khafre, so sound as it may appear, we must treat the evidence as circumstantial, until such time as a lucky turn of the spade of the excavator will reveal to the world a definite reference to the erection of the Sphinx.

Hassan's work included the first *complete* and modern excavation of the sand which, over millennia, had accumulated within the Sphinx enclosure. Hassan, therefore, had unique access to the stratigraphy of the accumulated debris and to the archaeological evidence in its proper context. This circumstance has not been available to subsequent investigators. Despite a wealth of finds, Hassan was still not able to attribute the Sphinx to any specific king.

### The alternative case

There is nothing new in the idea that the Sphinx was built at a time before the reign of Khafre. In his 1893 book *The Mummy*, Wallis Budge refers to an inscription found by Mariette which states that the Sphinx

existed at the time of Khufu. This inscription is carried on the so-called Inventory Stela – a late (26th Dynasty, 664–525 BC) artefact which tells how Khufu found the Sphinx and a nearby Temple of Isis in a ruinous state which he set about restoring. The stela was discovered in a small temple known as 'Isis, Mistress of the Pyramid', built onto the east side of one of the Khufu satellite pyramids.

The execution of the Inventory Stela is poor and the names used for the various deities mentioned in the text are clearly those employed during the Late Period. This has led many to argue that the Inventory Stela is a fake – a fraudulent attempt on the part of the Late Period Egyptians to re-discover a past which was, even then, of great antiquity.

Although the Inventory Stela *may* be a 'pious fake', the possibility should not be discounted that it is a copy of an earlier artefact. There are precedents for this – for example, a black granite stela of Shabaka (c. 712 to 698 BC) states that the pharaoh found an original document 'being eaten by worms'. Shabaka ordered the writing 'to be made anew', and so the wooden or papyrus original was recarved in stone.<sup>12</sup> Furthermore, the Inventory Stela refers to the tail of the Sphinx's *nemes* head-dress being struck by a 'thunderbolt'. As both Hassan and Mark Lehner have confirmed, there is indeed damage at this location, consistent with a strong blow, together with the apparent remains of ancient repair work.<sup>13</sup>

It is not only the earlier Egyptologists, such as Selim Hassan, who retain a somewhat open view over the age of the Sphinx. Rainer Stadelman also argues for an earlier

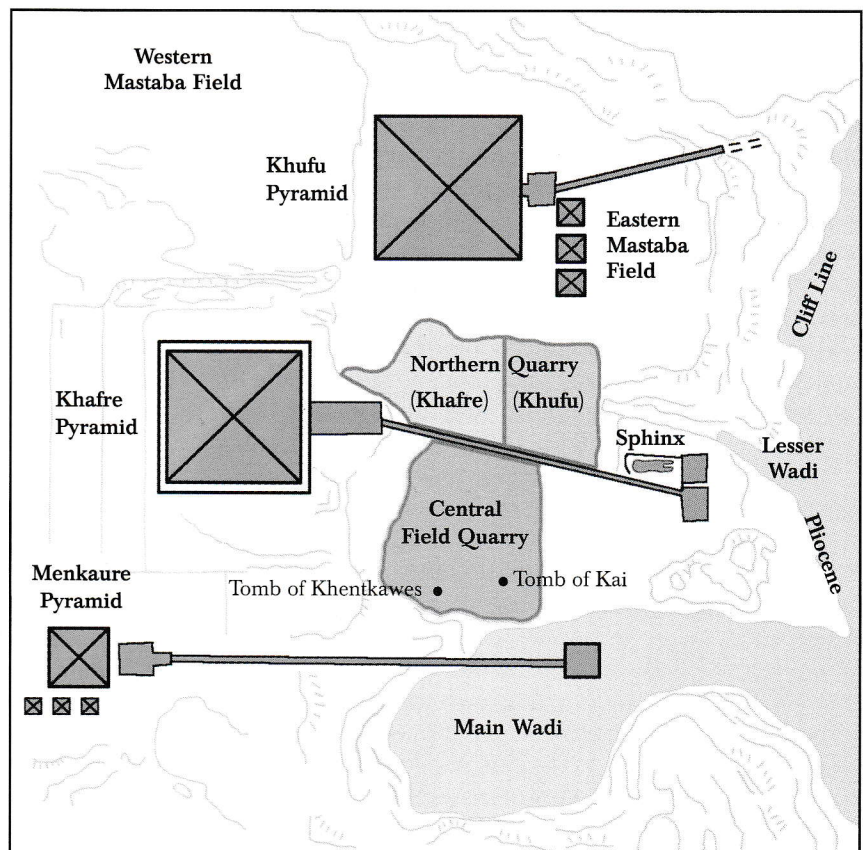


Fig. 2: Plan of Giza showing the features discussed in the text.

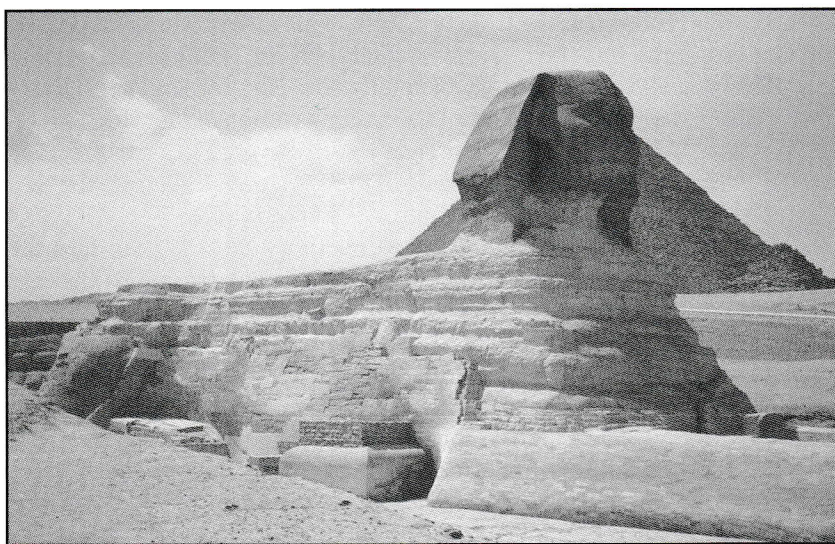


Fig. 3: The banded degradation as it appears on the body of the Sphinx today.

date for the monument – principally on the basis of the shape and iconography of the head of the Sphinx (especially the *nemes* head-dress). Stadelman uses this iconography to date the Sphinx to the reign of Khufu.

Stadelman's comments make very interesting reading, particularly as his arguments regarding the causeway of Khafre echo my own independently-arrived-at thoughts on this feature of the Giza necropolis (see below):

The causeway of Chephren takes account in its slanting course of something earlier, something important that already stood there; from the situation as it stands, this can only have been the Sphinx.<sup>14</sup>

However, the attribution of the Sphinx to Khufu on the basis of iconography is difficult to substantiate – especially as the only statue known for certain to be of Khufu is no more than 8cm high and does not show the pharaoh in a *nemes* head-dress. But Stadelman does make the interesting point that the *nemes* worn by the Sphinx is pleated all over, whereas those typically found on statues of Djedefre and Khafre (Khufu's immediate successors) show only the frontal lappets as pleated. Beyond that, though, there is little that can be said with any certainty. Fully pleated *nemes* head-dresses were worn in the Early Dynastic Period (for example the *serdab* statue of Djoser) and also feature during the New Kingdom (e.g. Tutankhamun's golden funerary mask). It therefore seems that iconography cannot be called upon for accurate dating as Stadelman argues. Despite this, I find his assertion that the Sphinx predates the reign of Khafre significant.

During his earlier work on the Sphinx, Lehner also appears to have been drawn towards the idea of a pre-4th Dynasty date for the Sphinx but then, after reconsidering the evidence, returned to the conventional position.

Lehner identified two types of restorative masonry on the Sphinx, the oldest of which consists of large limestone blocks, up to 1m in length, which had been placed directly against the *in situ* limestone.<sup>15</sup> These larger blocks were then

overlain by a second layer of later, brick-sized limestone masonry. Lehner initially considered that the earliest masonry was placed as part of the original (4th Dynasty) construction and was intended to make good any natural discontinuities in the limestone. To demonstrate this, he sought evidence for tool marks on the *in situ* limestone underlying the large masonry. However, as his report states '... 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 an attempt to reconcile these findings with the established 4th-Dynasty date for the

Sphinx, Lehner has since re-attributed the earliest masonry to the 18th Dynasty restoration made by Thutmose IV. A revised sequence of development, in which the origins of the Sphinx lie before the 4th Dynasty, would, on the other hand, make it possible to reconcile Lehner's 'severe erosion' with a much earlier restoration which Hawass has more recently confirmed to be of Old Kingdom date.<sup>16</sup>

However, by far the most notable recent theory must be that of geologist Robert Schoch and his associate John Anthony West. West is an advocate of the esoteric ideas of the Belgian 'philosopher' Schwaller de Lubitz who made a comment (almost it seems in passing) that the body of the Sphinx appeared to have suffered damage from being flooded. As West noted, the state of the limestones exposed around the Sphinx are indeed different in many ways from the majority of other limestone exposures at Giza – despite (under the conventional chronology) these exposures being of the same 4th-Dynasty age as the Sphinx.

A water-worn Sphinx, of course, clearly runs counter to the general theories of the history of the Sphinx and the contemporary Egyptian climate which is generally regarded as having been arid. The apparently water-worn Sphinx therefore suggested to West that the monument had a *very much* earlier origin.

In order to investigate this proposal further, West teamed up with Schoch in the hope of confirming that the degradation of the Sphinx was in fact due to water. Schoch was able to provide this confirmation but, rather than supporting a flood, he advocated erosion by rainfall.<sup>17</sup> In addition to the banded appearance of the Sphinx – with alternating projecting and recessed near-horizontal limestone beds (Figure 3) – Schoch identified what he referred to as a 'coved appearance' in which individual beds of the Sphinx enclosure were cut by deeply incised near-vertical features, with the limestone between each of these vertical features being rounded as if worn by water run-off (Figure 4). In Schoch's view, there has not been any substantial rains in Egypt since about 5000 BC. He further argued that this evidence of erosion by water provided a

*latest possible date* for the excavation of the Sphinx. In order to provide sufficient time for rainfall to have eroded the Sphinx and its enclosure walls, Schoch went on to date the construction of the monument to between 7000 and 5000 BC.

Schoch also carried out some geophysical work within the Sphinx enclosure, using seismic methods to establish the depth to which the limestones, exposed across the floor of the Sphinx enclosure, had been weathered. Schoch argued that the depth of weathering would be related to the period of time since the surface had been exposed. His studies suggested that there were indeed variations across the floor of the enclosure, with the deepest weathering in the east. Schoch thus argued that, if the shallow weathering was in areas excavated in the 4th Dynasty, the weathering which his seismic work indicated to be 50 to 100% deeper must be 50-100% older. Again, this dating placed the construction of the Sphinx to a period before 5000 BC.

Having advocated a pre-5000-BC date for the excavation of the Sphinx, Schoch attempted to establish a role or context for his early Sphinx model. In search of such a context, links with Jericho (from where stone masonry is known, c. 8000 BC) and stone artefacts from the Nabta Playa in southern Egypt (from about 6000 BC) were suggested.

## The counter arguments

### *Schoch's context for the early Sphinx*

As part of my research, I have considered Schoch's claim that the use of stone in building at Jericho and Nabta Playa provided a context for the early Sphinx which he proposes. With respect to the possibility of links with Jericho, Michael Baigent (in his book *Ancient Traces*<sup>18</sup>) links Predynastic pots found at Giza (discussed in more detail later in this paper) to evidence of traders from the Jericho region who had settled in the Late Predynastic town of Maadi, across the Nile valley from Giza (see the paper by Luc Watrin in this Journal). Baigent describes how many of the pottery remains encountered during the archaeological excavation at Maadi, were clearly influenced by Jericho – evidence, he concluded, that people from Jericho had settled in Maadi, bringing with them their knowledge of working masonry and (as he implies) building the Sphinx.

Whilst this link is intriguing, it cannot be substantiated by archaeological evidence from the Maadi site. An important publication on the subject is 'Maadi I – the pottery of the PreDynastic Settlement',<sup>19</sup> in which the authors discuss the presence of Palestinian (including Jericho) pots of Chalcolithic age (c. 4000-3000 BC). Not only is this date inconsistent with the pre-5000-BC date advocated by Schoch for the construction of the Sphinx, but the authors also note that the Palestinian pots were of a single type and represent only some 3% of the total assemblage. Given the rich variety of forms of Palestinian ware, the firm conclusion reached was that these pots were not imported in their own right, nor were they brought by settlers. Their presence in Egypt was evidence of trade in a limited range of commodities

imported from Palestine. The Palestinian pots found at Maadi were simply the standard containers for these commodities.

As for Nabta Playa, well the Sphinx actually has very little in common with the stone circle discovered at this site in southern Egypt (dated to approximately 6000 BC). The scale of the two monuments could not be different. The Sphinx, at over 70m long, contrasts starkly with the Nabta circle, which is only 4m in diameter. Unlike the Sphinx temple and Khafre valley temples (which West and Schoch also date to the same era as the Sphinx and which consist of carefully quarried worked and placed masonry) the Nabta circle is built from roughly hewn blocks. A number of large worked stones *have* been found buried in the sand at Nabta but, in spite of the fact that these monoliths show some advanced features of working in stone, they do not represent true masonry and cannot, therefore, be considered as comparable with the Sphinx and its associated structures.

In my view, these distant sites (Jericho and Nabta) fail to provide the early context for the Sphinx which Schoch has sought. More importantly, we do have archaeological evidence from Egypt for the period before 5000 BC. The capabilities of the cultures from this time are well established and clearly do not include the working of stone masonry.

### *The geophysical evidence reported by Schoch*

Geophysics, provides an immensely useful range of non-destructive *prospecting* tools. However, it is quite common for one geophysical technique to show anomalies where no features in fact exist. In addition, different results can often be obtained by the same technique if additional factors come into play. Conclusions drawn from geophysical investigation should always, therefore, be confirmed by intrusive methods. No intrusive investigation has been undertaken within the Sphinx enclosure by Schoch.

An illustration of the vagaries of geophysical survey is provided by the team from Waseda University in Japan,<sup>20</sup> who used two advanced geophysical techniques within the Sphinx enclosure: (a) ground penetrating radar (GPR) and (b) microgravity techniques. In their first season, the team used GPR with a frequency of 150MHz and identified two potential cavities in front of the Sphinx. During their second

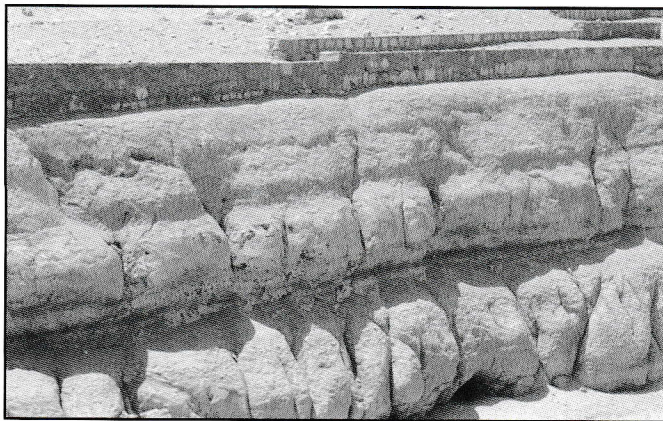


Fig. 4: The 'caved' degradation on the western enclosure wall.

season, however, the same techniques were used but with a reduced frequency of 80MHz. No significant anomalies were encountered at the appropriate locations on this occasion. Which set of geophysical data is to be believed? As Yoshimura *et al.* candidly state: 'It was found that the existence of a cavity could not be confirmed without a boring operation'. However, in Schoch's opinion the seismic geophysical surveys undertaken by Thomas Dobecki and himself confirmed his pre-5000 BC date for the original construction of the Sphinx.<sup>21</sup>

In my opinion, it is necessary to question the validity of Schoch's key assumption – that the results of the seismic geophysics actually represent evidence for weathering rather than some other factor. Schoch's conclusion, that the seismic survey indicates anomalous shallow weathering at the rear of the Sphinx, is only one possible interpretation of the data – there are other equally valid interpretations.

In his original KMT article on the age of the Sphinx Schoch discusses four seismic lines within the Sphinx enclosure.<sup>22</sup> The line at the rear of the Sphinx (line S3) suggested a depth of weathered limestone in the order of 1.2m. Three further lines (S1, S2 and S4) to the north and south of the Sphinx (parallel to the body and in front of the paws) indicated weathered rock to a depth of 1.8 to 2.5m. However, the KMT article simplified the original seismic work, omitting any discussion of seismic line S9, which ran across the floor of the Sphinx temple. In their joint paper, Dobecki and Schoch reported that S9 indicated weathering to 1.2-1.5m depth. In addition, they state that the depth of weathering indicated by S4 (in front of the Sphinx) approached 4m, not the 2.5m stated by Schoch in KMT. If these depths are plotted on an east-west section through the Sphinx enclosure and Sphinx temple (bearing in mind that the floor of the Sphinx temple is cut three metres lower than the floor of the Sphinx enclosure) the 'weathered' depths can

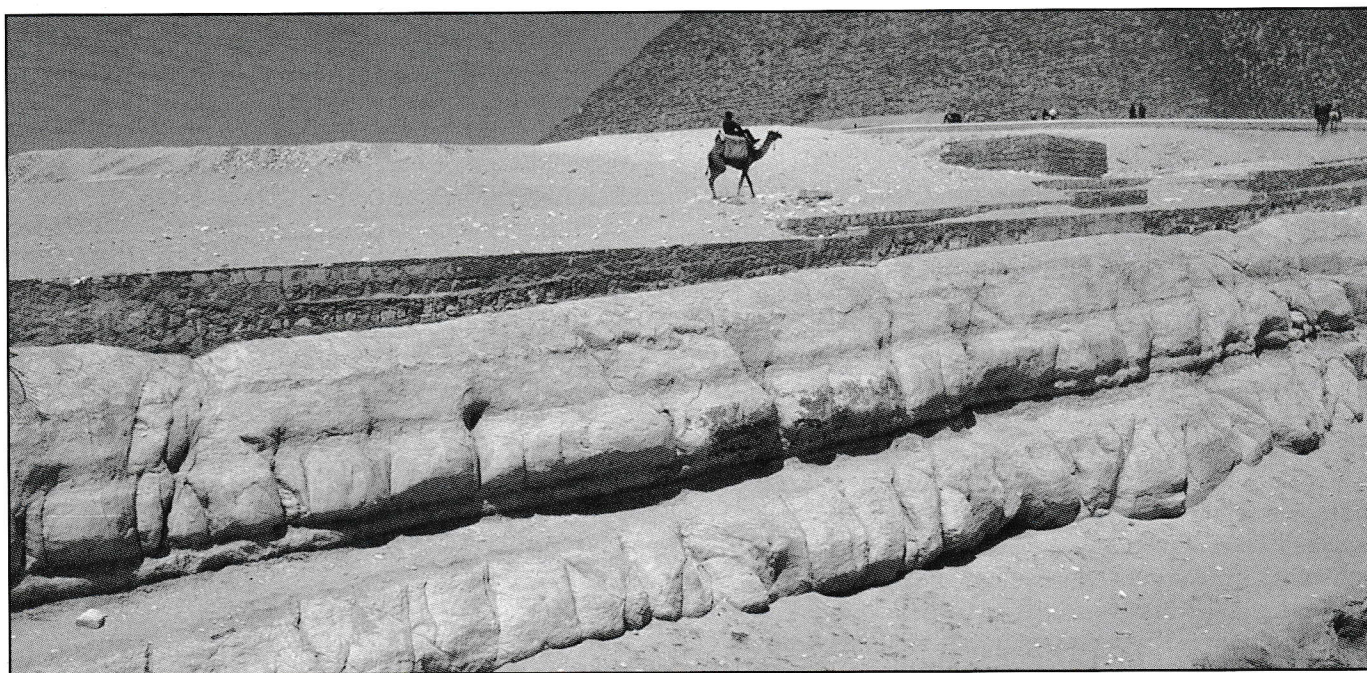
be connected by a sub-horizontal line which closely parallels the dip of the strata. Schoch's 'weathered zone', therefore, may be simply a function of the structure of the Member I rock – reflecting the bedding of the limestones beneath the Sphinx enclosure.

### *The geological case*

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'. As well as Egyptologists revisiting the *evidence* for the 4th Dynasty attribution of the Sphinx (some of which I discussed at the beginning of this paper), a number of geologists who had experience of working in Egypt countered Schoch's interpretation of the processes of weathering and erosion responsible for the morphology of the limestones exposed at the Sphinx. The two principal geological arguments were those of James Harrell<sup>23</sup> and of K. L. Gauri.<sup>24</sup>

Harrell argued that the degradation of the limestones within the Sphinx enclosure could be attributed to the effects of accumulations of wet sand which would locally enhance chemical weathering of the limestone. The processes Harrell described to promote the wetting of accumulated sand within the Sphinx enclosure included the introduction of water by extreme Nile inundations into the lower lying sands. This moisture, Harrell then argued, rose by capillary action up to 2m into the overlying sand. Although in hot, arid areas capillary fringes are present above groundwater *in bedrock*, it has to be questioned whether such a deep capillary fringe would develop in a loose, coarse grained soil, such as accumulated sand.

Given the difficulties with Harrell's theory, the wet-sand hypothesis has not been as widely supported as the con-



*Fig. 5: The western face of the Sphinx enclosure cutting showing the 'coved' heavy, rounded vertical degradation.*

clusions reached by Gauri. For a number of years Gauri had been working with Mark Lehner on the nature of the limestones exposed by the excavation of the Sphinx. One particular objective of Gauri's work was to establish the geo-chemistry of the limestones, the masonry and the mortar which had been used in the various phases of restoration of the Sphinx. As part of this work Gauri was able to recover samples of the limestone and mortar and have detailed laboratory analysis undertaken. Gauri's precise work led to a system of reference for the bedded limestone which is employed widely today and is summarised in Figure 6.

Gauri established that the lowest strata, Member I, consists of a massive and durable limestone, exposed across much of the base of the Sphinx enclosure. The lowest lying parts of both the body of the Sphinx and the western exposures are Member I strata, with the quarried height increasing towards the north-west. The entire northern terrace of the enclosure consists of Member I limestones.

The upper body of the Sphinx and the upper part of the enclosure walls to the south and west, consist of the overlying Member II strata – a series of seven fine grained limestone units. Of these seven units, units 1 to 6 have been further divided into two sub-units, the lowest of which consists of a less durable, marly rock (with the upper sub-unit being coarser grained and generally more durable).

The head and neck of the Sphinx are carved from Member III rocks which have also been divided into two sub-units. The neck of the Sphinx consists of relatively less durable rocks, whereas, the head has been carved from 'one of the most durable limestones exposed at Giza'. The durability of the Member III strata has been cited by others to explain the remarkable preservation of the Sphinx's face and *nemes* head-dress.

Gauri attributed the degradation of the Sphinx enclosure primarily to the effects of a process which he refers to as 'chemical weathering and exfoliation' in which dew, forming at night on the exposed limestone, removes soluble salts from the surface of the rock. Capillary forces draw this solution into the pores of the limestone matrix, where further salts are dissolved from the internal pore walls. As daytime temperatures rise, the solution begins to evaporate, precipitating salt crystals within the confined neck of the pores. The pressure which the crystals exert as they grow, leads to flaking of thin rock layers from the surface of the limestone.

Gauri argued that this process had operated throughout much of the accepted history of the Sphinx and was continuing at present. As Gauri explains it, the effect of chemical weathering on the bedded limestones produced a 'vertical profile of the Sphinx and the walls of the Sphinx enclosure made of alternating projections and recessions'.

It is important to note here that the degradation described by Gauri, which results from the action of chemical weathering and exfoliation, is controlled by the bedded

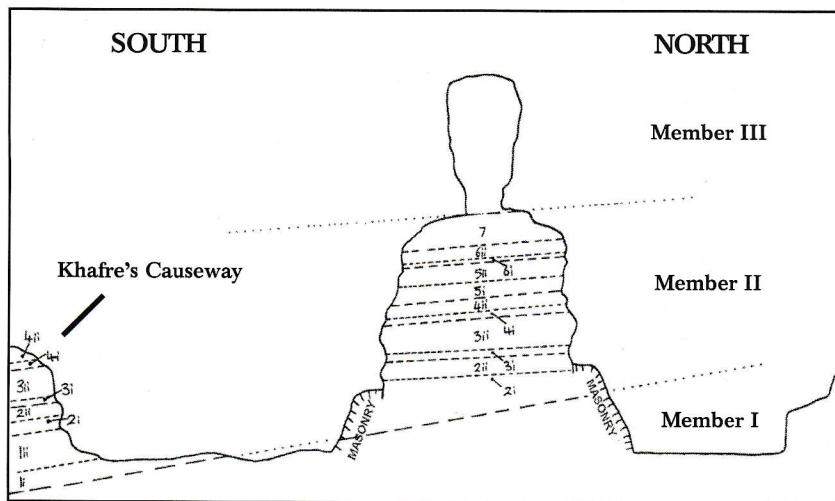


Fig. 6: A geological section through the Sphinx and Sphinx enclosure, showing the three limestone strata.

nature of the limestone, with the less durable units (those identified by the Roman numeral 'i') receding further from the cut face than the inter-bedded more durable strata. The process identified by Gauri therefore leads to the development of horizontal banding across the exposed limestones, as can be clearly seen on the body of the Sphinx (Figure 3).

The influence which the bedded nature of the rocks has had on the variation of the degradation – particularly of the Member II rocks – is an important consideration. But, as Schoch has pointed out, this horizontal banding is not the only characteristic feature of degradation within the Sphinx enclosure. What Schoch does not appear to have identified, however, is that the 'coved' degradation – considered by him to be the result of erosion by rainfall – is not present to any significant extent on the body of the Sphinx or on the eastern end of the southern enclosure wall. The 'coved' appearance is present only on the western walls of the Sphinx enclosure – that is the western wall behind the Sphinx (Figure 4 & 5) and the western section of the southern enclosure wall below Khafre's causeway (Figure 1).

I do not dispute that the processes of chemical weathering and exfoliation described by Gauri were responsible for extensive weathering of the strata within the Sphinx enclosure – the banded appearance of the body of the Sphinx testifies to the role that these processes have played. However, it is clearly evident that the features of degradation are more intense in the west of the enclosure. This greater intensity can not only be identified by the 'coved' appearance of the degraded faces in the west but also, as Gauri's own publications show,<sup>25</sup> by the fact that the banded degradation of the western enclosure walls is deeper than in the east of the enclosure. As this greater intensity represents a variation *along* rather than across the exposed beds, it can be considered as independent of the bedding and cannot, therefore, be explained by Gauri's model.

My conclusion is, therefore, that to explain all the features of degradation within the Sphinx enclosure, other factors must be taken into account and that the degradational history of the Sphinx is more complex than Gauri suggests.

## An alternative interpretation

With regard to the location of the Sphinx, the fact that the degradation of the Sphinx enclosure is more intense in the west and, moreover, is restricted to the walls of the enclosure is highly significant.

Although arid conditions dominated during the dynastic period of Egyptian history, wetter periods are known to have been experienced up until as late as the end of the 5th Dynast (OC approximately 2350 BC).<sup>26</sup> So, the rainy conditions of 5000 to 7000 BC, to which Schoch attributed the degradation of the Sphinx, were separated from the later arid conditions by a transitional phase which, between the Predynastic period and the end of the 5th Dynasty, was characterised by an increasingly arid climate interrupted by occasional, probably heavy, seasonal rains.

The Giza necropolis sits on a gently sloping limestone plateau, which falls from its highest point in the west (beyond the pyramid of Khafre) for a distance of over one and a half kilometres before reaching the former limit of Nile inundation (a short distance east of the Sphinx). With limited vegetation or sub-soil cover, sporadic heavy rainfall would have quickly saturated the fine grained limestones which form the surface of the plateau. Any excess water, unable to infiltrate through the saturated surface, would have been shed downslope as run-off. Although these rain-storms would have been of short duration, the momentum gained by run-off across an extensive catchment (such as that at Giza) must have produced surface flows capable of significant erosion.



*Fig. 7: 'Khafre's causeway' with the depressions marking the 4th Dynasty quarries on either side of the processional way.*

The presence of a small wadi to the north of the Sphinx (as already discussed above) suggests that the area originally lay within part of the natural drainage system of the Giza plateau. This natural drainage system may actually have been modified by the excavation of the Sphinx but the extent of any such modification cannot be assessed with any certainty. However, the important issue is that the eastward sloping topography of the site, together with the orientation of the Sphinx enclosure and any effect the excavation of the Sphinx may have had on the local surface hydrology, is likely to have led to the discharge of run-off into the west part of the Sphinx enclosure, eroding the limestone along the exposed western enclosure walls and selectively exploiting any joints exposed along the cut face.

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.

## The influence of water at Giza

So, the more intense degradation of the western walls of the Sphinx enclosure can be readily explained by the erosive potential of rainfall run-off. However, although erosion by run-off appears to offer the most likely explanation for observed features, it is important to give consideration to other processes in order to establish whether the degradation of the Sphinx enclosure could, perhaps, be explained in some other way.

Having already identified the problems associated with the wet sand hypothesis, I considered if there were any means by which chemical weathering and exfoliation may have led to the pattern of degradation which could be observed. The effects of chemical weathering could be modified in three ways:

- (1) By certain exposures being protected from degradation by, for example, accumulations of wind blown sand. Under such a scenario, unprotected areas would be more heavily degraded;
- (2) By variations in the intensity of chemical weathering itself, brought about by factors such as aspect (i.e. the orientation of an exposure with respect to the sun);
- (3) By the effect of sand abrasion.

Given the dominant northerly wind direction and the easterly slope of the plateau, dry, windblown sand is most likely to start filling the Sphinx enclosure from the north and west, with the covering of windblown sand protecting the underlying exposures. The exposures which were the



Fig. 8: The rear of the Sphinx enclosure, with the sand-filled Khufu quarry (A) beyond the modern low mudbrick retainer wall.

first to be covered with sand are therefore those in the west of the enclosure – which happen to be the most heavily degraded.

Aspect can greatly influence chemical weathering. Although the more intensely degraded western enclosure wall is exposed to direct sunlight throughout the morning, so too are the same limestone beds exposed across the ‘chest’ of the Sphinx. However, unlike the western enclosure wall, the east-facing ‘chest’ of the Sphinx does not exhibit the intense and characteristic ‘coved’ degradation. This evidence alone is sufficient to demonstrate that the more intense degradation in the western part of the Sphinx enclosure has not developed due to the aspect of the exposures.

As for the abrasive effect of windblown sand, movement of sand is controlled by a process known as saltation, in which individual grains of sand tend to ‘bob’ along the surface, only rarely getting carried at any significant height above ground level by the wind. Although, this process will affect exposures close to ground level, its effect on more elevated exposures is limited. The effect of sand abrasion within an excavation such as the Sphinx enclosure is also likely to have been limited. At an excavated site, airflow will lose much of its energy to turbulent flow in the wake of the lip of the excavation. This turbulent flow will cause any sand load to be dropped, rendering the erosive capacity of the sand negligible. The intense degradation located low

down on the walls of the western Sphinx enclosure could not, therefore, be the result of abrasion by wind blown sand.

These considerations lead me to conclude that any mechanism which relied on chemical weathering and exfoliation, sand abrasion, aspect, the protective effect of accumulated sand (or any combination of these processes) to explain the distribution of degradation within the Sphinx enclosure, appears to become increasingly contrived and, as a result, increasingly untenable. Not only is erosion by run-off the most straightforward explanation for the observable features at Giza but there is abundant evidence for the effects of such erosion.

During his 1930’s excavation at the site of Menkaure’s valley temple (a few hundred meters south of the Sphinx), George Reisner found evidence that part of the temple had been extensively damaged by storm run-off. Reisner’s interpretation of his finds was that, some time after Menkaure’s death, a wall built from mudbrick at the western end of the temple was washed away by surface run-off which (he concluded) followed heavy rain.

Remarkably, within the Sphinx enclosure itself there is unquestionable evidence for erosion by running water, in the form of a shallow erosion channel that appears to issue from the base of the ‘Main Fissure’, at the point where it is exposed in the southern Sphinx enclosure wall (Figure 1). This shallow channel, identified by Mark Lehner,<sup>27</sup> cuts into the slightly sloping rocky floor of the enclosure and runs towards the rear of the Sphinx temple.

### A pre-4th Dynasty Sphinx?

Of course, it is not necessary to question the attribution of the Sphinx to Khafre purely on the basis of the evidence presented above. Reisner’s evidence for post-4th-Dynasty rainfall run-off at Menkaure’s valley temple, together with the reconstructed climate of Egypt (with wetter conditions until the late 5th Dynasty), provide an opportunity for the western walls of a 4th Dynasty Sphinx enclosure to erode under the effects of rainfall run-off. So what reason is there to believe that the date of the Sphinx needs revision?

In a paper by Lehner entitled ‘The Development of the Giza Necropolis: The Khufu Project’, the development of Khufu’s mortuary complex is modelled, with particular attention being paid to the temporary works (quarries, ramps, accommodation, etc.) which were a vital element of the construction programme.<sup>28</sup>

Significant for the current discussion are two quarries, one of which is located to the west of the Sphinx and to the north of Khafre’s causeway (Figure 2). The position of this quarry can be identified today by a depression in the surface of the plateau, filled with accumulations of wind blown sand (Figure 7).

Excavation at the eastern base of the quarry has identified a pair of closely spaced, parallel walls, built from rough masonry faced with clay.<sup>29</sup> These walls have a general north-south alignment and show a slight slope up towards the mastaba field to the east of Khufu’s pyramid. Given their location and orientation, these walls have been interpreted

by Lehner as part of a construction ramp used during the development of Khufu's mortuary complex. This date has been confirmed by mud seal impressions bearing the name of Khufu which were found in debris excavated from between the walls. This evidence securely dates the working of the quarry to the reign of Khufu.

The significance of a quarry at this location can not be overstated. From the earliest phase of Khufu's development, this quarrying will have disrupted the surface hydrology at Giza, with the open excavation intercepting any run-off from the higher plateau in the west and preventing its discharge towards the area of the Sphinx.

Although first worked during the reign of Khufu, Lehner has argued that the quarry was extended to the west during the reign of Khafre. As these additional areas of quarrying were opened up across the plateau, mud brick from construction ramps and large volumes of chippings from the working of masonry may have been deposited in the earlier, worked-out areas. It is not clear how quickly wind-blown sand then accumulated over this construction debris. However, the surface hydrology of the backfilled quarry will have been very different from that of the intact limestone plateau which preceded it.

Given the fine-grained nature of the limestones and the presence of relatively impermeable marly horizons within the Member II strata which originally formed the surface of the plateau, saturation is likely to have been achieved under comparatively moderate rainfall conditions. By contrast, the higher permeabilities of the unconsolidated windblown sand, within the abandoned quarries, will have required significantly more extreme rainfall conditions before the sub-surface reached saturation and run-off was generated.

Although rain is still a feature of the Egyptian climate, and heavy sporadic rains are experienced from time to time (heavy rain fell in Egypt, particularly around Luxor in late 1994), I consider that, since the climate became more arid at the end of the Old Kingdom, it is highly unlikely that any rainfall will have been of sufficient intensity to generate run-off from the backfilled quarry.



*Fig. 9: The limited degradation of the 4th Dynasty cutting (left) immediately north of the Sphinx temple (right).*

Interestingly, an aerial photograph of the Great Pyramid (apparently taken in the late 1920's during Junker's excavations at the site) shows quite clearly the effects of contemporary surface water run-off across the backfilled quarries. In the photograph, a number of drainage channels can be seen which, outside the quarried area (to the north and west), are relatively shallow. However, within the quarried area, run-off has cut deep channels into the back-fill material. This evidence indicates that run-off across the quarry west of the Sphinx would erode into the loose back-fill rather than run across the surface.

Khufu's quarries can therefore be seen to have had a significant effect on the surface hydrology of the Giza plateau. The conventional sequence of development, in which the excavation of the Sphinx took place after the construction of Khufu's pyramid, provides no opportunity for rainfall run-off to reach the Sphinx. Yet without the action of this agent of erosion it is not possible to fully account for all the features of degradation which are present within the Sphinx enclosure.

It is on this basis that I conclude that the excavation of the Sphinx was undertaken some time before Khufu's quarrying began, when rainfall over the more elevated areas of the Giza plateau was able to run off from a substantial catchment, gathering momentum before finally discharging into the Sphinx enclosure.

## The age of the Sphinx temple

The geological evidence described above is not the only argument to suggest that the Sphinx pre-dates the 4th Dynasty. There is also evidence associated with the Sphinx temple.

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.<sup>30</sup> This indicates that the Sphinx and Sphinx temple were probably built at the same time. Given the geological evidence discussed above, this suggests that both features must pre-date Khufu's development of the site.

Let us consider the evidence cited in support of the 4th Dynasty construction of the Sphinx temple:

- (a) Archaeological excavation undertaken within the Sphinx enclosure encountered three large limestone core blocks within a mound of material supporting one corner of the 18th Dynasty temple of Amenhotep II. According to Lehner and Hawass, these blocks were left by the ancient builders '... as they were dragging them over to complete the core work on the corner of the Sphinx temple. One block rested upon debris containing numerous pieces of 4th Dynasty pottery.'<sup>31</sup>
- (b) A tall vertical face, has been quarried in the Member I strata, immediately to the north of the Sphinx temple. This quarrying begins at a point aligned with the eastern face of the temple, passes under the foundations of the Amenhotep II temple and extends westward to a posi-

tion opposite the north fore-paw of the Sphinx. This quarrying has been dated by Lehner to the 4th Dynasty on the basis of artefacts (including hammer-stones and pottery) found in a number of removal channels above the quarried face.<sup>32</sup>

Although this would appear to undermine my argument for earlier activity at Giza, there is evidence to suggest that this 4th Dynasty activity represents only a limited phase of construction within the Sphinx enclosure and cannot be used to date the original construction of either the Sphinx or Sphinx temple.

According to Ricke, a 'seam' can be identified which runs through the masonry of all four corners of the Sphinx temple.<sup>33</sup> Ricke states:

... this (seam) marked the outside of the walls of the temple in its *first* building phase. The north and south colonnades of the temple ... were added after the interior of the temple had been largely finished with granite sheathing. For the addition, the middle part of the north and south walls were pushed back, and great limestone core blocks were added to the *outside corners* of the temple, which were never finished off.

Given that the abandoned core blocks discovered under the Amenhotep II temple were destined for the 'corner of the Sphinx temple' they are evidently part of Ricke's second building phase. On the evidence of the pottery found beneath the masonry, this second phase of construction (together with the limited quarrying to the north of the Sphinx temple described by Lehner) can be dated to the 4th Dynasty. Ricke has not speculated on the period of time which separated this 4th Dynasty activity from the earlier phase of Sphinx temple construction. However, on the basis of degradation of the limestones exposed within the Sphinx enclosure, it is evident that the two operations were undertaken under very different conditions of weathering and erosion and were probably separated by a significant period of time.

The limited 4th Dynasty quarry face, identified by Lehner (Figure 1), was excavated from relatively durable Member I rocks. Since being quarried in the 4th Dynasty, this quarry face has been subject to weathering and erosion (including the processes of chemical weathering and exfoliation) – yet it exhibits only slight degradation (Figure 9).

By contrast, the same Member I beds, exposed elsewhere along the northern terrace, are more intensely degraded. The contrast in the intensity of degradation at the western limit of the 4th Dynasty quarrying is striking (Figure 10), with the exposures beyond the limit of quarrying being heavily degraded. The abrupt change in the state of degradation of the Member I beds exposed in the northern terrace makes it clear that a 4th Dynasty cutting has been made into a pre-existing excavated face which, at some earlier time, had been exposed to aggressive weathering or erosion.

Under my revised chronology, the distribution of degradation along the northern terrace can be readily explained:



*Fig. 10: The western limit of the 4th Dynasty cutting (A) and the heavy degradation of the limestones beyond.*

- (a) The construction of the Sphinx and the first phase of the Sphinx temple took place before Khufu quarried the site, during an era when the exposed limestone was subject to periodic erosion by surface run-off.
- (b) The Sphinx temple was subsequently incorporated into Khafre's 4th Dynasty mortuary complex, at which time it underwent a second phase of construction when modifications were made to the northern and southern walls of the temple, together with limited quarrying of the Member I limestones to the immediate north.
- (c) Because these modifications took place after Khufu's quarrying of the plateau, the newly exposed Member I limestones were not subject to erosion by rainfall run-off and, therefore, do not show the same pattern of intense degradation which is apparent elsewhere within the Sphinx enclosure.

### **Khafre's causeway**

Site inspection has shown that for most of its length, Khafre's causeway runs along a ridge of exposed bedrock, with a masonry pavement present only towards the east. Bedrock exposed beneath this pavement, on the northern shoulder of the causeway, indicates that this masonry is only a single course thick and has been used simply to provide a constant gradient along the causeway.

The eastern end of the causeway runs along the top of the southern Sphinx exposure and, when viewed in plan, it can be seen that these two features share a common alignment (Figure 1). Experience suggests that such common alignments rarely develop by chance, raising the possibility that the two features were constructed at the same time. And so, if the Sphinx pre-dates Khufu, it logically follows that the causeway must also have been constructed some time before Khufu's development of the site.

Further support for this conclusion is provided by the two quarries which were worked during Khufu's reign and

discussed earlier in this paper (Figure 2). When dealing with the southernmost quarry, Lehner states 'At the north, the floor of the quarry appears to slope up to the Khafre causeway ...'. Later, when discussing the northern quarry he adds that the area 'contained dumped debris which apparently fills an extensive quarry *limited on the south by the Khafre causeway and on the east by the Sphinx depression*'.<sup>34</sup>

Under the conventional chronological scheme 'Khafre's causeway' did not exist at the time of Khufu's quarrying. If this had been the case, why was the extent of the quarrying limited by a feature (i.e. the causeway) which was only conceived in Khafre's reign? The conventional sequence of development requires us to accept that Khufu's workmen went to the trouble of opening up a second quarry, leaving an intact limestone ridge – which we now know as Khafre's causeway – between the two quarries. Why did they not simply extend the northern quarry southwards by removing the linear body of limestone which, at the time, served no apparent purpose?

The positioning of the two quarries clearly suggests that, like the excavation of the Sphinx and the construction of the Sphinx Temple, the *alignment* of 'Khafre's causeway' was established some time before Khufu's work at Giza. Under this revised sequence of development, interpretation of the spatial relationship between the causeway and Khufu's quarries becomes quite straightforward, with the existing causeway limiting the extent of the later quarrying work.

### Khafre's mortuary temple

'Khafre's causeway' links the Sphinx and adjacent temples in the east to Khafre's pyramid in the west. When considering a revision to the sequence of development at Giza, the king's mortuary temple is particularly interesting.

Firstly, this temple can be seen to consist of two distinct elements, characterised by different architectural styles (aerial photographs show a clear dislocation between these two elements). The remains of the western temple (closest to Khafre's pyramid) consist of low lying, moderately sized, well squared masonry (typically one or two courses) and, when viewed in plan, a large proportion of this part of the temple consists of open space. By contrast, the eastern end of the temple consists of large (cyclopean) masonry, each block being the equivalent of several courses high (see Figure 11). When viewed in plan, a large proportion of this section of the temple consists of masonry, with relatively little open space. In many areas the masonry is severely degraded, with much of this degradation continuing across the exposed faces of adjoining blocks, suggesting that the erosion has taken place whilst the masonry was *in situ*.

In addition to the quite distinct architectural styles, the cyclopean portion of the temple appears to be constructed on an elevated site, with ground levels falling away sharply to the east and less steeply to the west (towards the foot of Khafre's pyramid). These observations have been confirmed by reference to survey drawings which show that ground levels in the vicinity of the mortuary temple reach the highest point at the western limit of the cyclopean masonry.<sup>35</sup>

When viewed from the east – from the area of the Sphinx for example – the cyclopean section of the mortuary temple can be seen to have been built on one of the most prominent points on the western 'horizon' at Giza. The elevated site even obscures the base of Khafre's pyramid. This dominant position on the western 'horizon', the distinct and ostensibly more primitive architectural style of the cyclopean portion of the mortuary temple, and its clear association with the causeway (and consequently the Sphinx), might indicate that this structure – the proto-mortuary temple – also pre-dates Khufu's development of the site.

This suggests that (as was the case at Sakkara where the earliest part of the necropolis was built on the edge of the escarpment overlooking the valley) topography was one of the primary influences upon the layout of the pre-Khufu structures at Giza. It therefore follows that the alignment of 'Khafre's causeway' may have been established simply by directly connecting the prominent sites of the Sphinx and the proto-mortuary temple with a ceremonial way.

### Rock-cut foundation walls

The evidence assembled so far indicates that there are a number of structures within the Giza necropolis – including the proto-mortuary temple, 'Khafre's causeway', the Sphinx and the Sphinx temple – that pre-date Khufu's development of the site.

There is one other feature which adds some weight to this pre-Khufu grouping of these structures – a feature shared by the Sphinx temple and proto-mortuary temple and, to my knowledge, by no other temple at Giza.

The floor of the Sphinx temple is some 3m lower than the floor of the Sphinx enclosure – the two being separated by a vertical cutting which forms the western wall of the temple itself. In addition to this western wall, some of the internal walls at the rear of the Sphinx temple are also carved from the *in-situ* limestone, rather than having been constructed from masonry (as is the norm elsewhere).

At the eastern end of the proto-mortuary temple, this same unusual architectural feature can be seen. Again the lower courses of the walls appear to have been cut from the bedrock as the general ground levels were intentionally lowered to produce a level floor.<sup>36</sup> As with the Sphinx temple, the full height of the structure was achieved by placing masonry on these lower rock-cut walls.

### The Khafre valley temple

I have already set out my reasons for linking the Sphinx temple and the proto-mortuary temple – but what of the Khafre valley temple? How does that fit into the development of Giza?

I do not include the Khafre valley temple in the pre-4th Dynasty development at Giza. First, the work on the detailed fossil assemblages in the limestones at Giza (undertaken by Thomas Aigner<sup>37</sup>) was unable to establish the source for the valley temple masonry. This source, to my knowledge, has still not been fully established.

Second, there are also a number of marked differences in style and structure between the two temples. The main points are:

- (a) The two structures are architecturally quite different. The Khafre valley temple consists of massive walls assembled from large blocks placed many courses deep, which surround quite minimal internal space. The Sphinx temple, by contrast, consists of a large open space enclosed by comparatively thin walls, just one masonry block thick.
- (b) The columns in the valley temple are granite monoliths, those in the Sphinx temple are of local limestone.
- (c) The valley temple is in much better condition than the Sphinx temple, with the walls having survived to a greater height and more of the granite casing remaining *in situ*. That the New Kingdom temple of Amenhotep II was built over the north-western part of the Sphinx temple (Figure 1) suggests that, even at this relatively early time, the Sphinx temple was already in an abandoned or ruinous condition. This suggests that it is not just the more robust construction of the Khafre valley temple which has led to its better survival.
- (d) As discussed above, the second phase of the Sphinx temple construction, identified by Ricke, included the moving of the north and south walls of the temple outwards and adding extra masonry to the corners of the structure. Figure 1 shows the south wall of

the Sphinx temple and the adjacent north wall of the Khafre valley temple both aligned with the causeway. The similarity in size of these temples and the alignment of the walls is taken as an indication that the two temples were built at the same time – in accordance with a unifying theme. This view is persuasive until it is noted that only in its second (4th Dynasty) phase of construction was the south wall of the Sphinx temple aligned so as to be parallel with the causeway and adjacent wall of the valley temple. In its original pre-4th Dynasty form the Sphinx temple walls were all aligned to the four cardinal points.

### Towards an absolute date

The evidence presented so far only provides the most general relative dating for the construction of the pre-4th Dynasty Sphinx complex.

The use of stone in monumental architecture in Egypt is known from the Predynastic period. However, this usage was largely restricted to monoliths (e.g. Nabta Playa and the Coptos statues). The use of stone *masonry* for the Sphinx complex suggests a later era with a more developed method of stone construction.

It is generally thought that the oldest stone structure in ancient Egypt is the 3rd Dynasty step pyramid of Djoser. This is a misconception. The Palermo Stone attributes construction in stone to the last pharaoh of the 2nd Dynasty – Khasekhemwy. This date was consistent with the earliest known stone masonry in Egypt – from the Gisir el-Mudir at Sakkara (provisionally dated to the mid- to late-2nd Dynasty<sup>38</sup>). However, recent research undertaken at an archaic stone temple in western Thebes (Thoth Hill) has suggested that the structure may be dated (through alignments with the star Sirius) to c. 3000 BC.

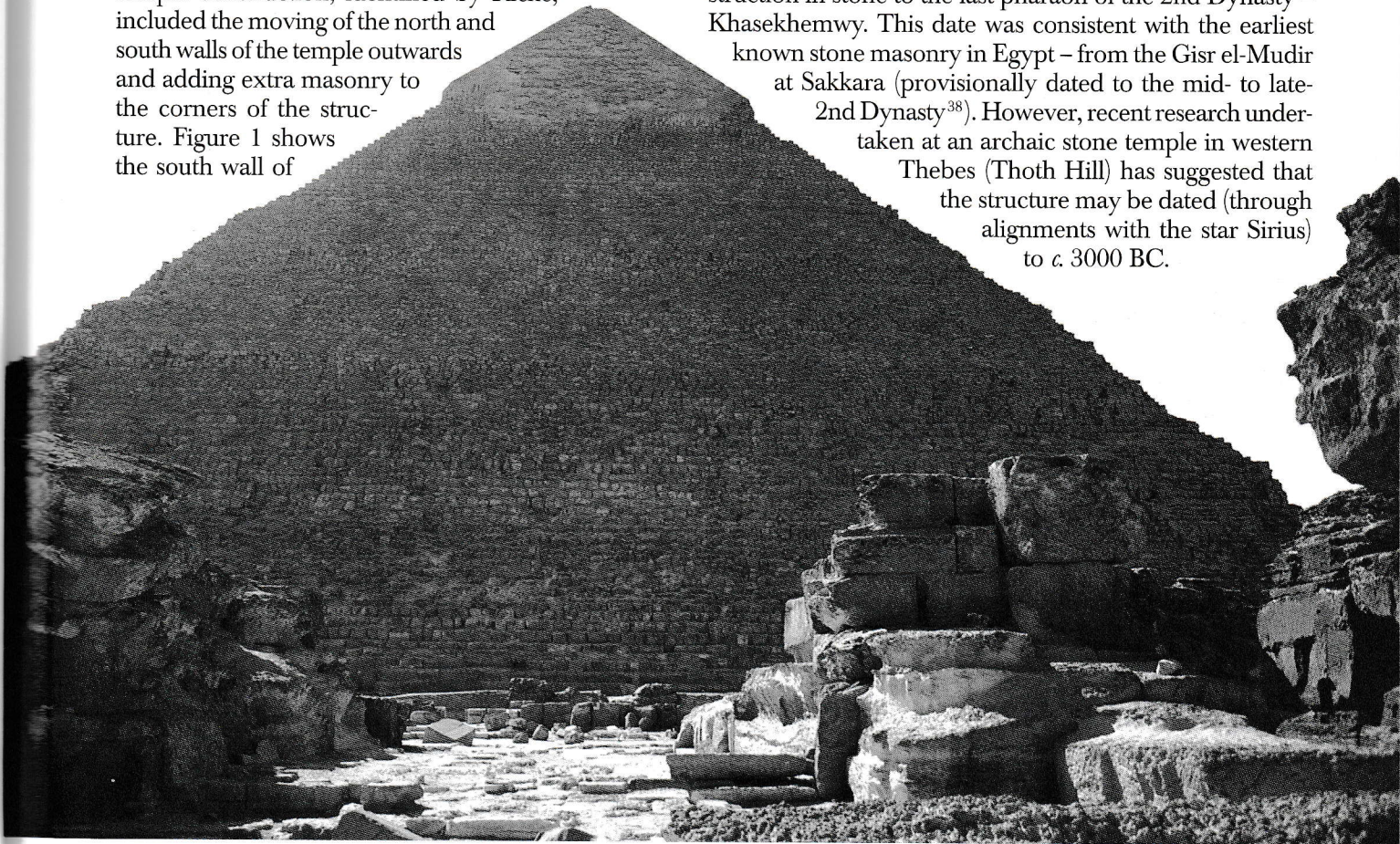


Fig. 11: Khafre's mortuary temple at the foot of the pyramid, with the heavily eroded cyclopean blocks in the foreground.

These early dates for stone masonry in Egypt have been confirmed by recent excavation at Helwan near Cairo, where true masonry was used in tomb construction. The excavation team's report contains the following, passage:

The Early Dynastic tomb at Helwan is the product of a mastermind who had considerable experience in designing a monumental stone structure ... the quite secure date of Tomb 1 to the late 1st or early 2nd Dynasty consolidates the already previously acknowledged but never widely accepted existence of a school of stone masonry in the Memphite area which enabled kings and élites of this period to employ megalithic stone construction ... hundreds of years before the construction of the pyramids.<sup>39</sup>

So there *was* an established stone-working capability in Early Dynastic Egypt. There is, however, nothing in the archaeological record to indicate the working of large scale masonry before this time. The known use of stone masonry – beginning in the Early Dynastic period – thus provides a *terminus post quem* for the construction of the early Sphinx complex.

An additional consideration is that Khufu appears to have respected these pre-existing structures during his own quarrying operations, which indicates that they had some religious or other significance. On this basis, a possible sequence of development for Giza can be considered in which the origins of the Sphinx may lie at the transition between the Predynastic and Early Dynastic periods.

At this time the east-facing hill on the edge of the plateau – from which the Sphinx was later carved – perhaps resembled the head or face of a lion and was seen to greet the rising sun. In the *Pyramids of Egypt*, Edwards states:

In Egyptian mythology the lion often figures as the guardian of sacred places. How or when this conception first arose is not known but *it probably dates back to remote antiquity*. Like so many other primitive beliefs it was incorporated by the priests of Heliopolis into their *solar creed, the lion being considered the guardian of the gates of the underworld on the eastern and western horizons*.<sup>40</sup>

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'.<sup>41</sup>

The choice of Giza as the site of Khufu's pyramid complex came at a time when the sun-god Re was rising to national prominence. Khufu's son and successor, was given

the name Djedefre ('Enduring Like Re')<sup>42</sup> which perhaps indicates the importance of the sun-god to Khufu at this time. Contrary to the views of some commentators,<sup>43</sup> the use of the name of the sun-god in royal names did not begin with the 4th Dynasty. The use of 'Re' in the pharaoh's name, first appeared in the early 2nd Dynasty – the name 'Nebre' having been translated as 'Re is my Lord'.<sup>44</sup>

Later, in the 4th Dynasty, as part of the construction of his pyramid complex and to strengthen his association with Re, Khafre decided to incorporate the existing solar-cult monuments into his own mortuary complex – building his valley temple adjacent to the existing Sphinx temple (which he modified). Khafre then constructed a covered processional way along the existing causeway and incorporated the proto-mortuary temple into his own mortuary temple. Khafre may also have been responsible for the Old Kingdom masonry placed on the body of the Sphinx and for re-carving the Sphinx's head into that of human form (although work by police forensic artists has shown that this was not undertaken to produce a likeness of Khafre).<sup>45</sup>

Having proposed an Early Dynastic date for the construction of the Sphinx, there is one other issue which needs to be addressed. Is the more intense degradation of the western Sphinx enclosure walls and the western part of the northern terrace consistent with an Early Dynastic date for the construction of the Sphinx? In other words, does this sequence of development provide sufficient time for the more intense degradation to have taken place? I believe the answer to this question is yes, for the following reasons.

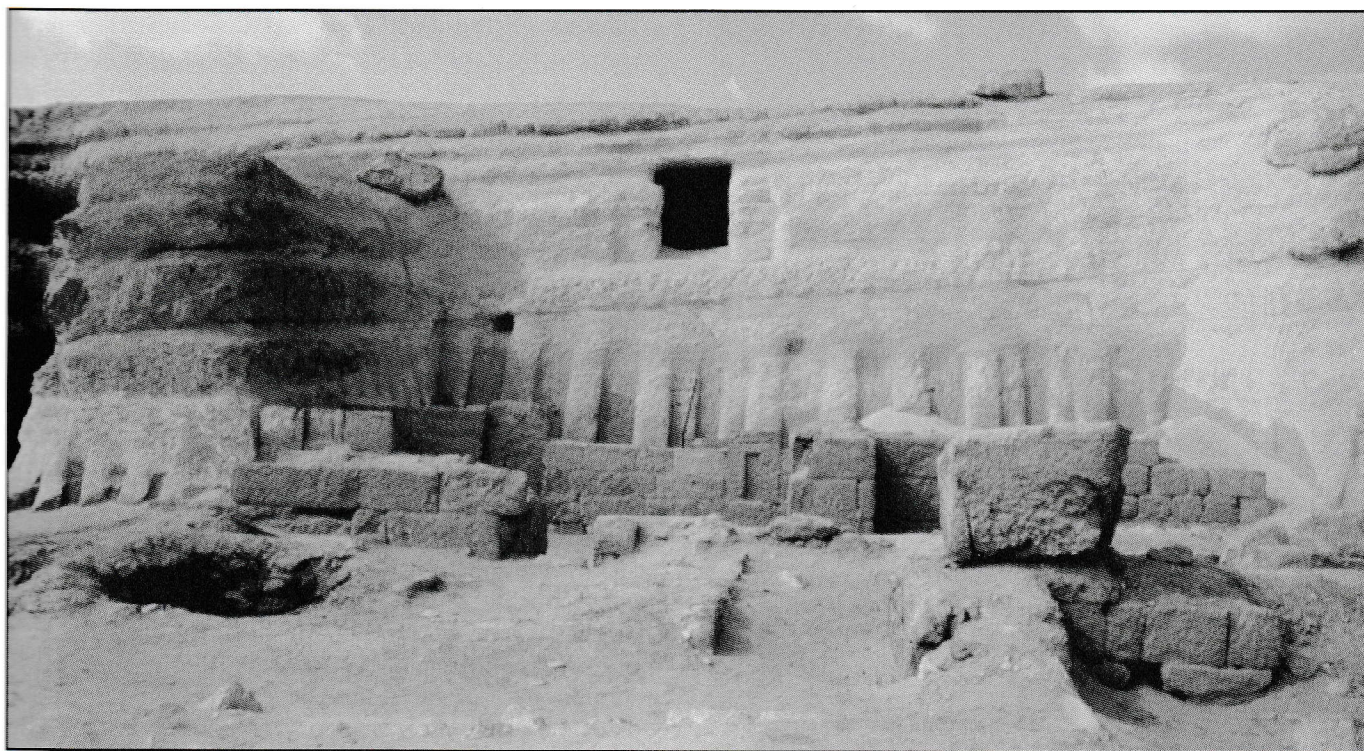
In the western part of the Sphinx enclosure, periodic erosion from run-off would have removed much of the weathered mantle – the result of chemical weathering which dominated conditions between rainfall events. This would have exposed comparatively unweathered strata from beneath. Given the increased soluble component of these newly exposed rocks, it follows that the effect of this seasonal erosion will have been to promote renewed phases of chemical weathering and exfoliation, thereby accelerating the degradation process.

Under these particularly aggressive conditions of weathering and repeated erosion, the more intense degradation of the western Sphinx exposures could quite easily have developed over a period of time which, in geological terms, was relatively short.

### Other evidence for early activity at Giza

It is generally considered that extensive development at Giza was limited to the 4th Dynasty and what little activity there was before this was restricted to areas to the south of the necropolis. Although my argument for an Early Dynastic solar-cult complex, with the Sphinx at its focus, clearly runs contrary to this general opinion, there is published archaeological evidence to indicate some activity within the Giza necropolis from as early as the late Predynastic period.

As discussed by Baigent (see above), Mortensen<sup>46</sup> discusses four ceramic jars, reportedly found in the late 1800's 'at the foot of the Great Pyramid' (the exact location has



*Fig. 12: The remains of the niched-façade on the eastern cut face of the tomb of Kai with Old Kingdom masonry in the foreground.*

not been recorded). When these jars were first found, the Predynastic period was little understood and, given the accepted 4th Dynasty context of the Giza site, the jars were assumed to be of 4th Dynasty date. Mortensen, however, has re-examined these jars and considers them to be typical of the late Predynastic Ma'adi period. Given that the jars were found intact, Mortensen has also argued that they were from a burial rather than a settlement site. These jars, together with other isolated finds at Giza, have been interpreted as evidence for a Ma'adi-period settlement at Giza that was destroyed when the 4th Dynasty pyramids were built.<sup>47</sup>

Set against the context of the 4th Dynasty development, the destruction of Predynastic and Early Dynastic artefacts within the Giza necropolis is an important consideration. When the 4th Dynasty land-use of the site is considered, most of the available area within the necropolis was either quarried or built upon. These are both rather destructive activities which may have necessitated the removal of earlier structures and the disposal of the resulting 'site clearance' debris. This debris may have been deposited in the base of worked-out quarries or in other known areas of dumping, outside the area of construction.

In the mid 1970's, Karl Kromer, investigated one such area of debris, approximately one kilometre south of the Great Pyramid.<sup>48</sup> Within the fill, Kromer reported finds from the Late Predynastic, 1st, 2nd and 4th Dynasties.

Kromer's work has been criticised by Butzer,<sup>49</sup> however, analysis of this critique shows that Butzer did not question the age of the finds but concentrated on Kromer's interpretation, suggesting that the stratigraphy of the excavation site was more complex than Kromer had reported. Whereas

Kromer identified the deposition of only a single 'settlement', Butzer suggested that a number of such episodes were represented, the remains of which were separated by layers of wind-blown sand and possible debris slides. Butzer *did* accept that the deposits excavated by Kromer consisted of accumulations of drift-sand together with the remains of development which had been removed from the area of the pyramids and dumped at the excavation site during the Old Kingdom.

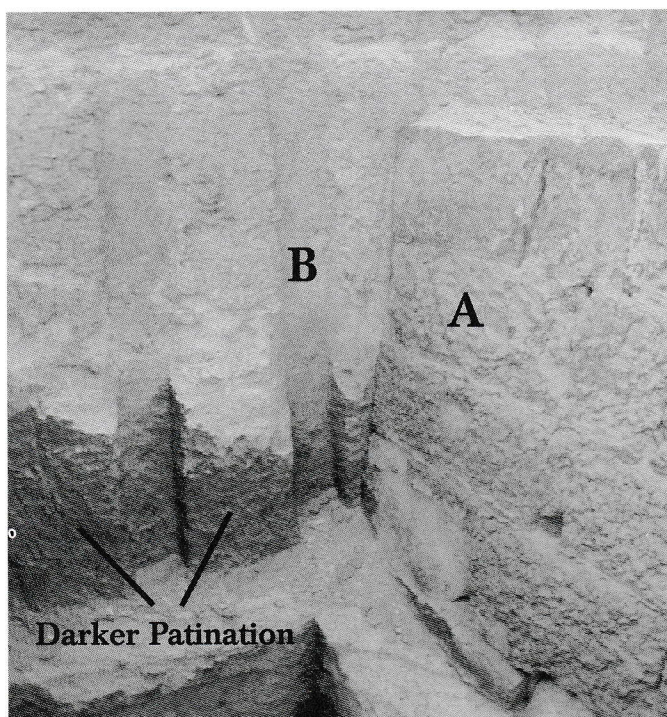
Although Butzer did not criticise the age attributed to the finds, Kromer's interpretation *has* been criticised by others. Whilst the age of ceramics, stone tools etc. may remain contentious, most people do accept the jar sealings that were excavated as being of Early Dynastic date.<sup>50</sup>

So, the claims for the strong '4th Dynasty context' of Giza begin to look increasingly insecure. Although most of the pre-4th Dynasty artefacts found at Giza have been recovered from outside the 4th Dynasty necropolis, it can be argued that the mechanism by which this earlier material was removed from its original position and deposited elsewhere, is widely understood and generally accepted.

Further evidence that there was Early Dynastic activity at Giza may actually come from within the necropolis itself – particularly the Central Field Quarry area, and the tombs of Khentkawes and Kai (Figure 2).

Both the lower rock-cut element of the Khentkawes tomb and the nearby rock cut mastaba of Kai bear two groups of features that are of considerable interest for my argument.

Firstly, on these two tombs, the upper limestone beds are cut by features of erosion which resemble (but are less intense) than those on the western Sphinx enclosure walls. In my view, such features were formed before the pattern



*Fig. 13: Old Kingdom style masonry (A) placed against and covering the darker niched-façade (B) at the tomb of Kai.*

of surface drainage at Giza was disrupted by the large scale 4th Dynasty development of the site which, in relation to these tombs, included extensive quarrying, upslope, within the Central Field Quarry area.

Remarkably, on these two tombs, the features – so suggestive of pre-quarrying or pre-4th Dynasty erosion – are accompanied by a second set of features which also suggest an Early Dynastic origin. On the lower walls of these tombs are the weathered remains of niched- or palace-façade decoration – a typical Early Dynastic architectural device.

The niched-façade features on the tomb of Khentkawes have been recognized by others,<sup>51, 52</sup> and are limited to the lower part of the southern wall of the tomb, facing the Main Wadi (Figure 2). In its completed 4th Dynasty state, the Khentkawes tomb was faced throughout with a limestone casing. This casing will have obscured the rock-cut niches, further suggesting that the niched features pre-date the use of the tomb for the burial of Khentkawes.

In the case of Kai (Figure 12), the remains of the niched-façade extend along both the southern and eastern faces of the superstructure, facing both the main wadi and the Nile valley itself. Whether there is any significance associated with the fact that the niched-façades appear only on the faces of the tombs facing the Nile and its associated former waterway is uncertain.

When compared with the tomb of Khentkawes, the excavated niches on the eastern face of the tomb of Kai are better preserved, extending to a greater height up the external walls of the rock-cut mastaba. This better preservation can be readily explained as the result of protection from degradation provided by a number of subsidiary tombs constructed against the eastern face of the mastaba.

The use of the Early Dynastic niched-façade on the exterior of the tombs of Khentkawes and Kai, differs significantly from the austere architectural style generally adopted at Giza in the 4th Dynasty, with plain façades interrupted only by false doors and individual offering niches. Although their age appears not to have been established during excavation,<sup>53</sup> the tombs built against the eastern face of the mastaba of Kai exhibit this plain, typically Old Kingdom, architectural style (see Figure 12).

Although these apparently Old Kingdom tombs have prevented the degradation of the underlying niches, from close inspection it is apparent that there was a period of time between the excavation of the niches and the later, apparently Old Kingdom construction. Behind the Old Kingdom masonry, the limestone from which the niched panels were cut has a dark patina, a product of weathering (see Figure 13). The preservation of this patina does not coincide with the extent of the overlying masonry. It can only be concluded, therefore, that the niched-façade had weathered considerably before the adjacent Old Kingdom masonry was added.

On the basis of the features of erosion along the upper beds of these two rock cut tombs, the weathering of the niched-façade, and the juxtaposition of apparently Old Kingdom tombs, I would argue that the mastaba of Kai and the lower rock-cut element of the Khentkawes tomb, originally formed part of an Early Dynastic development at Giza – the development which had as its focus the Great Sphinx and associated structures.

The work of both Mortensen and Kromer and the detailed architecture of the tombs of Khentkawes and Kai demonstrate that there is evidence for pre-4th Dynasty activity at Giza. What is noteworthy is that the period of time indicated by this evidence is consistent with the time-scales that I have established on the basis of other quite independent considerations (such as the use of stone masonry in Ancient Egypt).

## Conclusions

When, in October 1997, I first produced a paper on my views of the age of the Sphinx, the scope of the 'evidence' I cited was fairly restricted. On the basis of the nature and greater intensity of the degradation of the limestones in the west of the Sphinx enclosure, and the effect that Khufu's quarrying had on the hydrology of the plateau, I concluded that the Sphinx and a number of other structures must have pre-dated the 4th Dynasty. Taking into consideration the earliest known use of stone masonry in Egypt, I dated this Sphinx complex to the Early Dynastic period.

At that time, I was unaware of the 4th Dynasty cutting in the Member I terrace in the north of the Sphinx enclosure, and unaware of the work of Mortensen and Kromer and the implications of their finds on the evidence for Early Dynastic activity at Giza. I was also unaware of the detailed architecture of the tombs of Khentkawes and Kai and the evidence for advanced masonry in the Early Dynastic cemetery at Helwan.

Since reaching the conclusion that the Sphinx is an Early Dynastic monument, continued research has uncovered so many additional factors which appear to confirm my initial view that Giza was a site of at least local importance in the Early Dynastic period, several centuries before the pyramids were built on the necropolis. I believe that the weight of evidence is such that it is now extremely difficult to reconcile the geology and archaeology of the plateau with Giza's conventional 4th Dynasty origin.

Undoubtedly, Khafre did have a major influence on the Sphinx – but not as its builder. I believe that the unique layout of Khafre's mortuary complex, which included the Sphinx and Sphinx temple, developed as a result of that pharaoh's usurpation or re-working of the existing solar-cult complex. How better could the association of the king with the sun-god have been symbolised, other than by linking Khafre's 'mansion of eternity' with a long established site of solar worship and the everlasting circle of birth, death and re-birth manifested by the daily rising and setting of the sun? □

## Notes and References

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2. For example see, R. Stadelman: 'Royal Tombs from the Age of the Pyramids' in Schulz and Seidel (eds): *Egypt – the World of the Pharaohs* (Konemann, 1998).
3. For example see, S. Quirke: *The Cult of Ra* (Thames and Hudson, 2001).
4. J. Baines and J. Malek: *Atlas of Ancient Egypt* (1980), p. 36. For consistency all conventional dates used in this paper have been taken from this reference.
5. For example, see: M. Lehner *et al.*: 'The ARCE Sphinx Project – A Preliminary Report' in *Newsletter of the American Research Center In Egypt*, 112 (1980), pp. 3-33.
6. M. Lehner *et al.*, *op. cit.* [5], n. 6, p. 20.
7. For a discussion of the disposition of quarries within and adjacent to the Giza necropolis see M. Lehner: 'The Development of the Giza Necropolis – The Khufu Project' in *MDAIK* 41 (1985).
8. F. El-Baz: 'Environmental Considerations in the Conservation of the Sphinx' in *Proceedings of the First International Symposium on the Great Sphinx* (Cairo, 1992), fig 4, p. 245.
9. The tomb of Kausert, for example (B. Porter and R. Moss, vol. III, (Memphis, 2nd Edition 1994), p. 286 and plan XXIII, grid D-10), is partly rock cut (much of the original masonry superstructure is now missing), however, the upper rock surface of this tomb preserves the original slope of the ground. That the original ground levels in this part of the site rise towards the north is confirmed by M. Lehner in his paper 'Notes and photographs on the West-Schoch Sphinx Hypothesis' (*KMT* 5:3 (1994), pp. 40-48.) '... from the south wall of the Sphinx ditch and down the slope away from the ditch to the south behind the Valley Temple [of Khafre] ...'. Here Lehner is referring to the topography to the south of the Sphinx, describing how the ground at this location falls away towards the Main Wadi in the south.
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12. *Ibid.*, p. 117.
13. M. Lehner *et al.*, *op. cit.* [5], p. 19.
14. R. Stadelman, *op. cit.* [2].
15. M. Lehner *et al.*: *op. cit.* [5].
16. Z. Hawass: *Abstract for the First International Symposium on the Great Sphinx* (Egyptian Antiquities Organisation, Cairo, 1992). '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.'
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33. M. Lehner, *op. cit.* [30], pp. 136-58.
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