

ANCIENT EGYPT

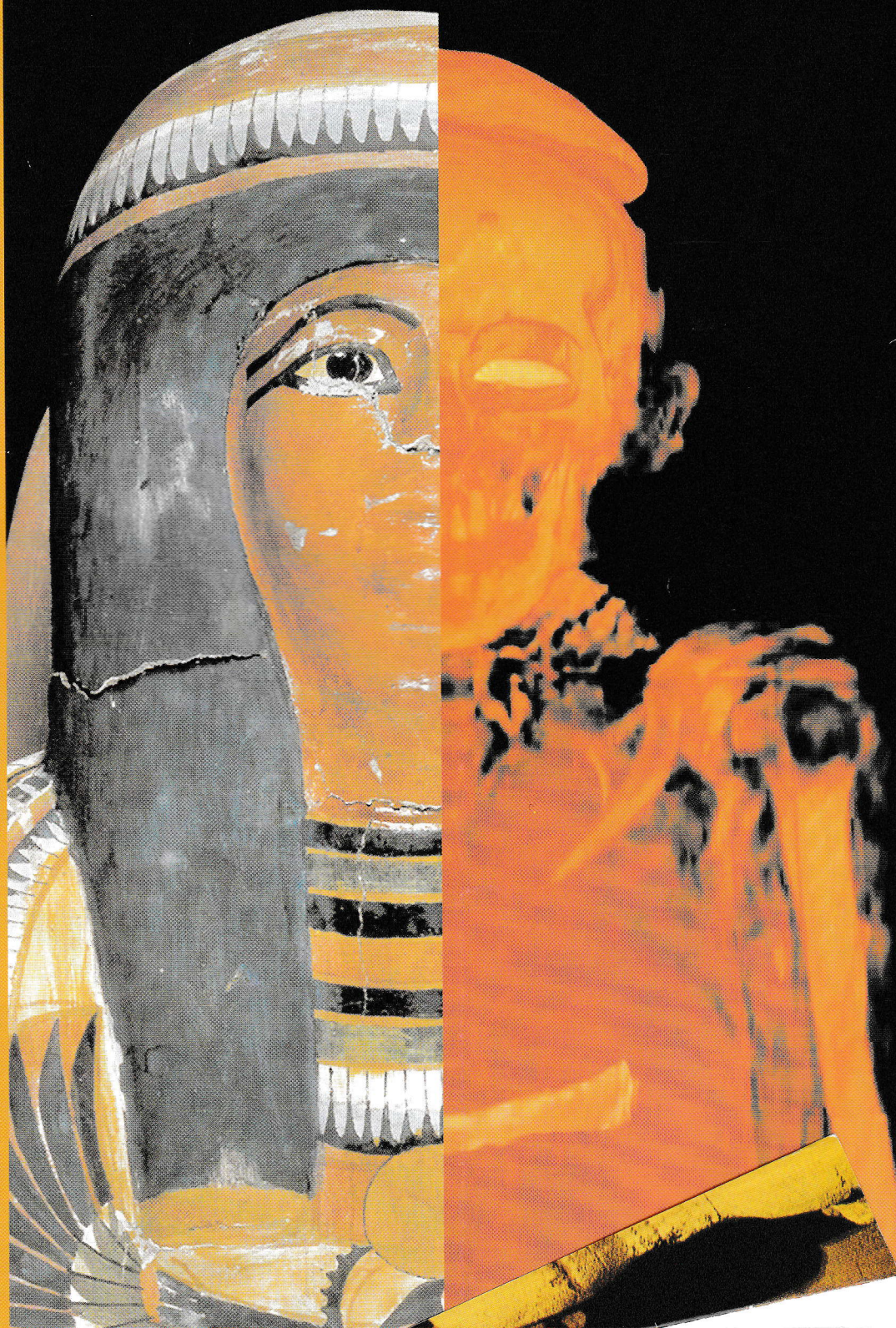
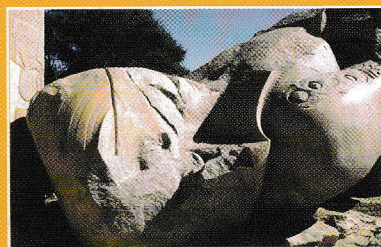
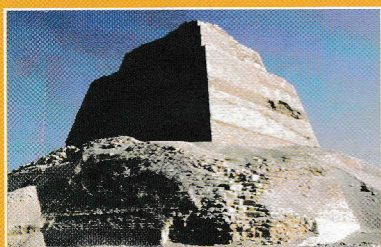
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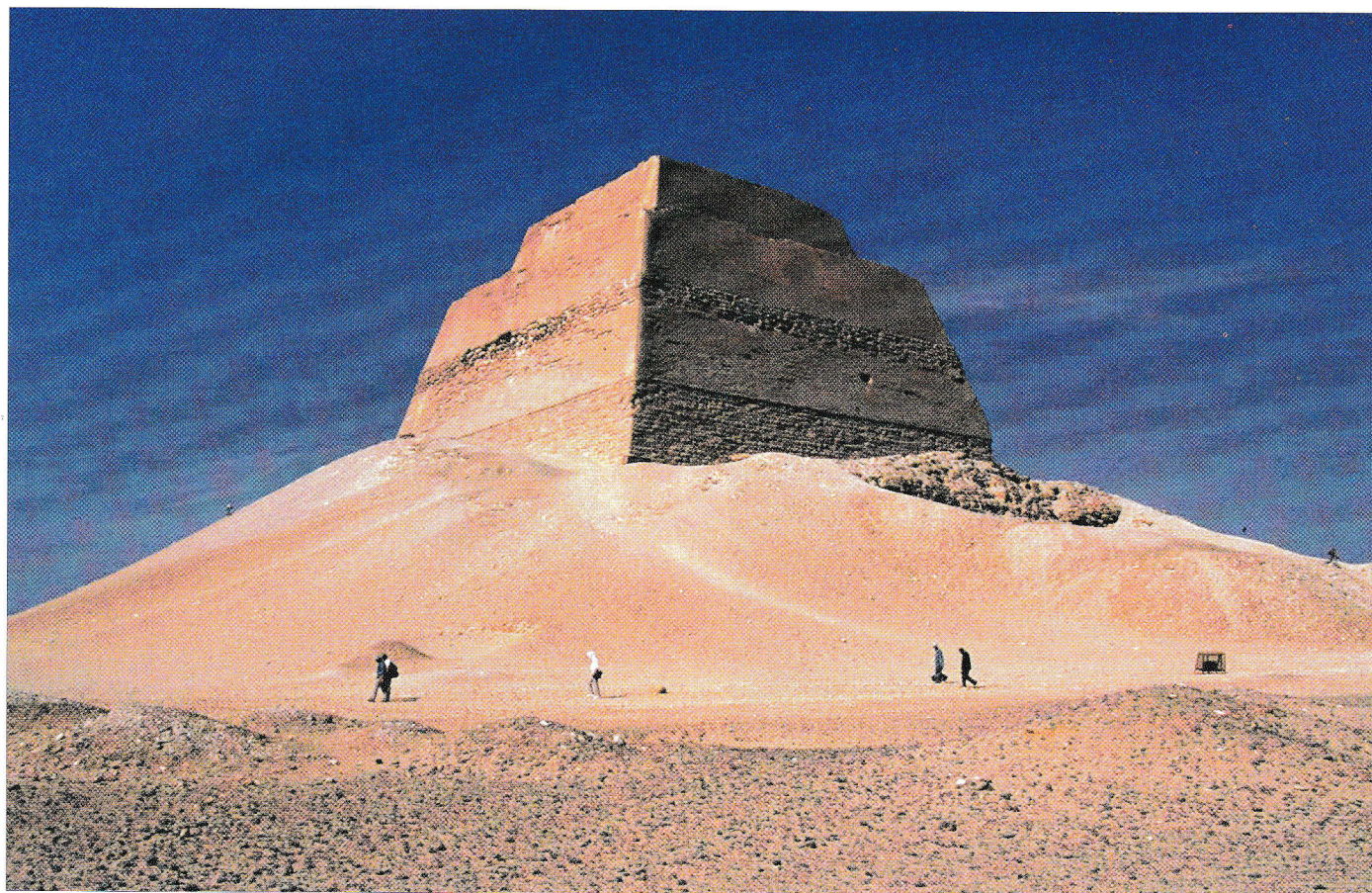
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What Happened at Meidum?

The Meidum pyramid stands on the edge of the desert some 50 km south of Cairo. You can see it from afar but what you see is only the core of a pyramid surrounded by a great mound of debris. It is clear that something has gone terribly wrong with it: only the broken remains of a great monument are left, and every visitor wonders how it got that way. Did it fall or was it pushed? Did it collapse or was it dismantled?

Tony Judd and Colin Reader investigate.



View of the pyramid of Meidum showing the core of the pyramid projecting from the debris.

The Pyramid of Meidum is interesting for several reasons. For one thing, it marks the transition from stepped pyramids to true. It was first built with seven steps, like Zoser's pyramid at Saqqara but larger. Later it was enlarged to eight steps, and later again it was turned into a true pyramid with flat faces. At each stage the outer stones were dressed smooth, and at each enlargement the whole pyramid was encased in a layer of new stonework. The remains of the true pyramid were completely hidden by the pile of debris and only revealed when Petrie dug some of it out in 1891. Now, if you visit Meidum, you can see a large expanse of the smooth final casing which has been exposed near the entrance in the north face, and if you climb to the top of the pile of debris the remains of both stepped pyramids are clearly visible. More recent excavations have revealed the north-west corner of the true pyramid's base.

Another odd thing about this pyramid is that it seems to have been built, or at least completed, by Sneferu, the first king of the Fourth Dynasty. This is strange because at least two others, the "Red" and "Bent" pyramids at Dahshur, were built by him. What on earth did he need three large pyramids for (let alone another small one at Seila)? It is even more strange when you realise that there is no trace of a royal burial – no sarcophagus, no grave goods – in any of them (although those with a macabre turn of mind may speculate about the dismembered bones found in the Red Pyramid when its chambers were cleared in 1950).

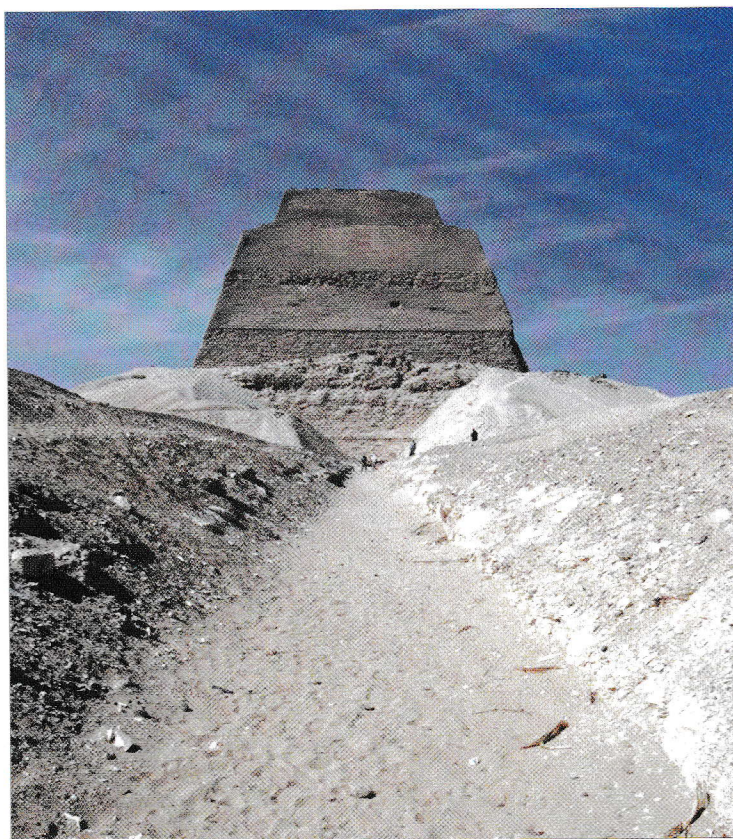
Ever since 1793 when a man called Browne found some casing stones among the debris, and 1837 when Perring noticed others built into a local bridge, it has been believed that the Meidum pyramid collapsed because it had been attacked by stone-robbers. It would have been a valuable quarry because it contained three complete casings of dressed stones. The unwanted filling stones may lie among the debris, which might have been built up with sand and gravel to make ramps for dragging the loot away.

While most experts agreed that something like this explained the present dilapidated state, not everyone was convinced. In 1963 a distinguished physicist, Kurt Mendelssohn, visited Meidum and, after examining the remains, came to the conclusion that it had collapsed naturally before it was completed because there were weaknesses in the way it was constructed. He went on to surmise that this disaster occurred while the Bent Pyramid was actually being built. When it happened the builders of the latter thought the reason was the steepness of the new-fangled smooth-faced design, and changed to a shallower angle to complete it. They then went on to build the whole of the Red Pyramid at the shallower angle. Only later, in the reign of Khufu, were construction techniques improved so that they could safely return to the steeper angle they preferred for the pyramids at Giza. Mendelssohn published this theory in the *Journal of Egyptian Archaeology* in 1973 and elsewhere, and in 1974 he went on to write a best-selling book about it: *The Riddle of the Pyramids*.

His theory implies that two pyramids were under construction at the same time, and that building went on throughout Sneferu's reign. He believed the work required an army of seventy thousand men during each inundation, and that the mobilisation of such a huge force acquired a momentum of its own. They could not just be laid off when a pyramid was near completion: they had to be kept in employment, so another had to be started. There was a production line of pyramids regardless of whether there were enough dead kings to fill them. He believed that the organisation of this activity was the crucial in the setting up of the centralised Egyptian state.

Mendelssohn's theory is plausible and interesting and comes across well both in his book and on television. Unfortunately it is wrong. The crucial fact, which he unaccountably overlooked, is in a small uncompleted mortuary temple by the east side of the pyramid. This was buried under the debris until Petrie dug it out. When he did so, he found graffiti from the Eighteenth, Nineteenth, and Twentieth Dynasties on the walls! You have to be very ingenious to explain how they got there if the temple was buried when the pyramid collapsed one thousand years before the Eighteenth Dynasty.

The remains of the causeway leading up to the mortuary temple at the base of the pyramid





View of the small mortuary temple and the two large uninscribed stelae.

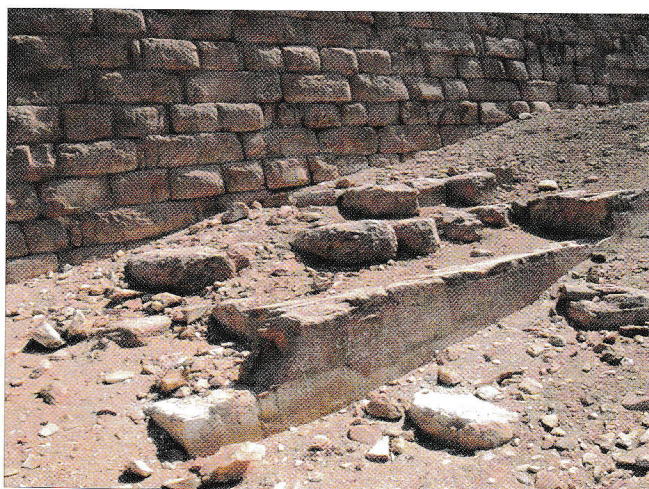
The Egyptologists were merciless about this mistake. Edwards, in *The Pyramids of Egypt*, dismisses Mendelssohn's work as "mistaken" without mentioning his name or his book. Jean-Philippe Lauer, the doyen of French Egyptology, refuted him savagely in a 1976 paper in *Chronique d'Egypte*.

Mendelssohn does not seem to have responded to the attack. This is a pity in a way, because in his enthusiasm Lauer overstates his case in some respects. He says rightly that the pyramid could not have collapsed completely during construction – the graffiti prove that – but he is not right when he says that a pyra-

mid is necessarily stable. This is true when the blocks of which it is made are rectangular and laid in horizontal courses, but it is not necessarily the case when, as at Meidum, they are laid in slanting columns which lean against the central core, and especially when each enlargement of the pyramid saw new masonry placed on near horizontal steps and against the smooth sloping outer casing of the original seven and eight-step pyramids. These enlargements depended in part on the generation of friction along these contact surfaces to hold them in place. Under normal circumstances, friction even on the smooth surfaces is likely to have been adequate to hold the structure together, but if they were shaken, by a severe earthquake for example, the casing of the true pyramid and the outer stepped pyramid might have come slithering down.

What neither Mendelssohn nor Lauer seem to have noticed, however, is that whether it collapsed naturally or otherwise there must be more to the story. For a start there is the question of what the pile of debris actually is. Rough calculations show that its volume is far too small to account for all the material that

Remains of the casing of the seven and eight-stepped pyramids projecting from the top of the mound of debris.



has evidently been lost from above, assuming, of course, that the pyramid *was* completed. Moreover what is visible now is not fallen stone but a great pile of gravel and sand. This is particularly obvious where it has been excavated to expose the mortuary temple. Here, and everywhere else except near the north-west corner, it contains no large blocks.

In 1993 Johnson, writing in *KMT*, proposed that the mound of debris is the remains of ramps built to enable the pyramid to be dismantled, starting in the Nineteenth Dynasty. Certainly it looks like that. By the side of the mortuary temple the gravel seems to be laid in sloping planes angled at about twenty-seven degrees to the horizontal, a convenient gradient for dragging blocks away as they were prized out. Above the top of the pile of debris there are gaps in the casing of the innermost pyramid at the corners and in the north and west faces where some of the blocks have been removed, presumably indicating where the most recent stone-robbers were working. The use of the debris for ramps to remove masonry from the site would also explain why the amount of debris that remains today is far less than the amount of material that has been "lost" from the pyramid.

Even though stone-robbing does seem to be the main cause of the dilapidation Mendelssohn's theory is not necessarily completely dead. It might have been a partial collapse when the pyramid was nearly finished that caused Sneferu to abandon it. There are several reasons for thinking this.

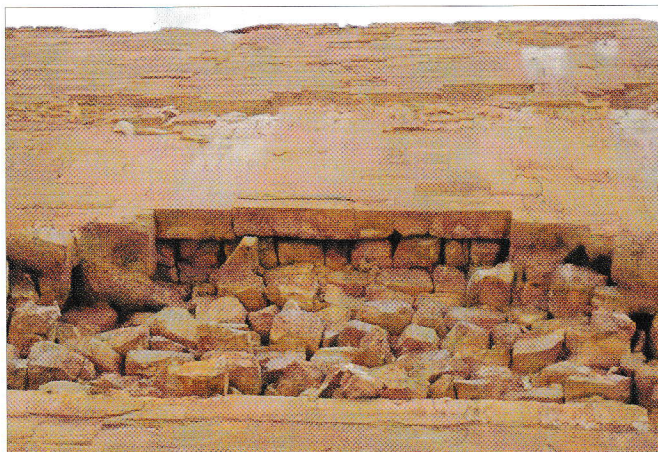
If you visit the site, the guardians are only too pleased to take you into the burial chamber. A long sloping corridor leads down to a short horizontal gallery just below ground level. From this a rickety ladder allows you to climb up a shaft into the chamber itself. It is rectangular with a high pointed ceiling formed by a corbelled vault. Its shape is similar to that of the chambers in the Red Pyramid at Dahshur, but it differs in that the stone has been left rough: it was never finally dressed. This, and the absence of any sign of a sarcophagus, are strong indications that it was not finished.

There are others. By the mortuary temple there are two large stelae, both completely blank. They were ready for a dedicatory inscription, but it was never



The recently excavated north-west corner and base of the pyramid, showing the original outer dressed stone corner of the seven- and eight-stepped pyramid, covered with the rough blocks that formed the outer skin of the true pyramid.

written. In addition, in the debris close to the north-west corner, excavators have found over three thousand limestone blocks. Some of them were worked, others were not, and some had typical Old Kingdom graffiti and quarry marks. Moreover, Old Kingdom pottery shards and other datable material were found with them. The place where these blocks were found is thought to be the



The work of the stone robbers high up on the side of the pyramid.

Photo:
Tony Judd.



The rear of the mortuary temple built right against the east face of the pyramid, showing the two stelae and the remains of a stone ramp.

masons' working area where the rough-cut stone was received and worked. That so many blocks of all kinds (casing, core masonry and backing stones) were found in an Old Kingdom context suggests that the final stage of the pyramid – the addition of its smooth outer casing –

was never finished. The blocks would have been abandoned where they lay when the masons' work was interrupted. The graffiti on these blocks may provide further clues to the history of the monument. Many had received red quarry or masons' marks containing dates for the working of the stone. These were from "years of the sixteenth, seventeenth and eighteenth occasions [of counting the cattle]", which have been equated to regnal years 32 to 36 of someone's reign, although no reference to Sneferu has yet been found. Another feature, which counts against Mendelssohn's idea that the workforce was employed seasonally when there was no work in the fields, is that the marks on the blocks are from all seasons of the year, not just the inundation.

There are a few indications about the later history of the pyramid. There are Nineteenth Dynasty graffiti in the descending corridor indicating that it was open at this time, and the graffiti in the mortuary temple show that it was not buried until after the Twentieth Dynasty, but Twenty-second Dynasty burials in the debris, between 6 and 9 m above the base of the pyramid, show



The corbel-vaulted burial chamber at the heart of the Meidum pyramid, showing that the blocks were not dressed and that the chamber was, therefore, unfinished.

that it had accumulated soon after the end of the New Kingdom. Graeco-Roman graffiti near the top of the pyramid on an exposed part of the eight-stepped pyramid show that by this time the dismantling was well under way. Reports of a five-stepped structure have survived from the Middle Ages suggesting that the present three-stepped form is the result of continued dismantling throughout history.

So what happened at Meidum? The only way to find out for sure would be to remove *all* the debris, all 250,000 tons of it, and find out what it consists of and what lies underneath it. Until that is done – and presumably it never will be done – or until someone finds a papyrus saying “I saw the Meidum pyramid collapse and this is what happened ...”, all we have is conjecture. Here is our conjecture:

Although it is not proved it is most likely that Sneferu decided for some reason to convert the eight-step pyramid into a true pyramid – the first of its kind. When it was nearly complete, part of the new outer casing high on the north side slipped off, possibly triggered by an earthquake. He abandoned the work, leaving the mortuary temple complete but undecorated, and concentrated his efforts at Dahshur where at least one pyramid was already under construction. The lower part of this had been built in the normal way, but thinking, incorrectly, that it was its height which made Meidum unstable, Sneferu had the upper part completed at a shallower angle for safety, so creating the Bent Pyramid. Unfortunately, this went wrong when cracks appeared in the interior structure and he abandoned it as well. After this second setback, he tried again, this time being very conservative

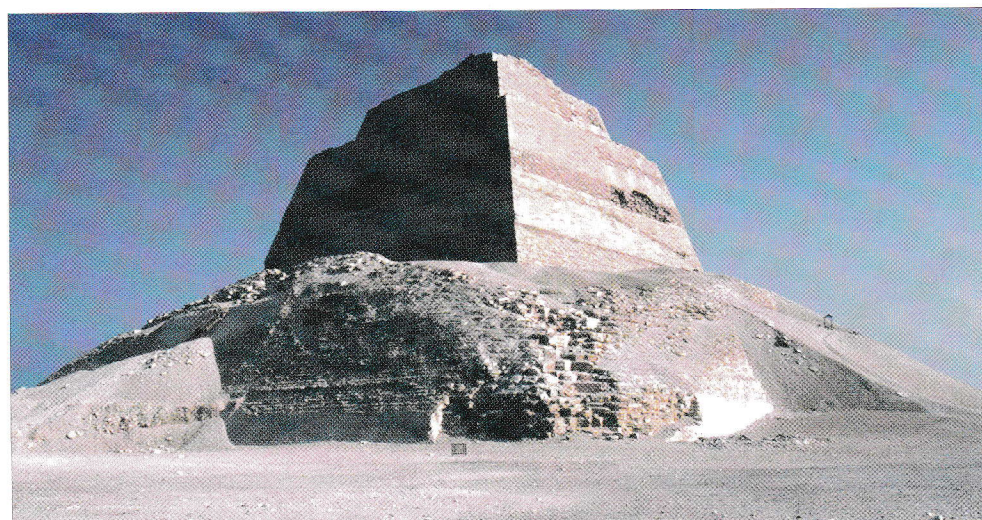


An ancient cedar-wood beam (and a more modern electric light bulb) inside the Pyramid of Meidum.

and building at the shallower angle from the ground up, and this became the Red Pyramid. There are some stones in the Red Pyramid bearing dates from the same regnal years as those at Meidum, which might have been diverted from there to the later work after the collapse.

The Meidum pyramid remained a forlorn ruin for a thousand years, but in the Nineteenth Dynasty the grandiose building schemes of Seti I, Ramesses II and Ramesses III caused a shortage of building stone, so the contractors turned to Meidum, erected ramps so that they could get at the top of it easily, and stripped the dressed casings of the true outer pyramid and the eight-step pyramid and began on the seven-step pyramid. Then the building programme slowed down and large-scale stone removal ceased, although over the years from then until now the odd block has been taken for local jobs.

That is just one suggestion. The best thing to do is to visit Meidum for yourself. It is only an hour or so's taxi ride from Cairo. Not many tourists go there



View of the Pyramid of Meidum from the north-west, showing at the very base, the sloping sides of the true pyramid.



Above:

The guardians at Meidum.

Photo: Tony Judd.

Above right:

The upper part of the pyramid showing the banded-core of the structure.

Note that what appears to be a layer of mud is, in fact, wasp nests.


so you will probably have the site to yourself, and the guardians are friendly and keen to show you all there is to be seen. And then, on the journey back to your hotel, you can work out your own solution to the mystery of Meidum!

Tony Judd and Colin Reader.



Tony is a member of the Manchester Ancient Egypt Society who has travelled extensively in the Middle East.

Colin, the newly-appointed Secretary of the Manchester Ancient Egypt Society, is a professional geologist.



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