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OF THE NILE VALLEY



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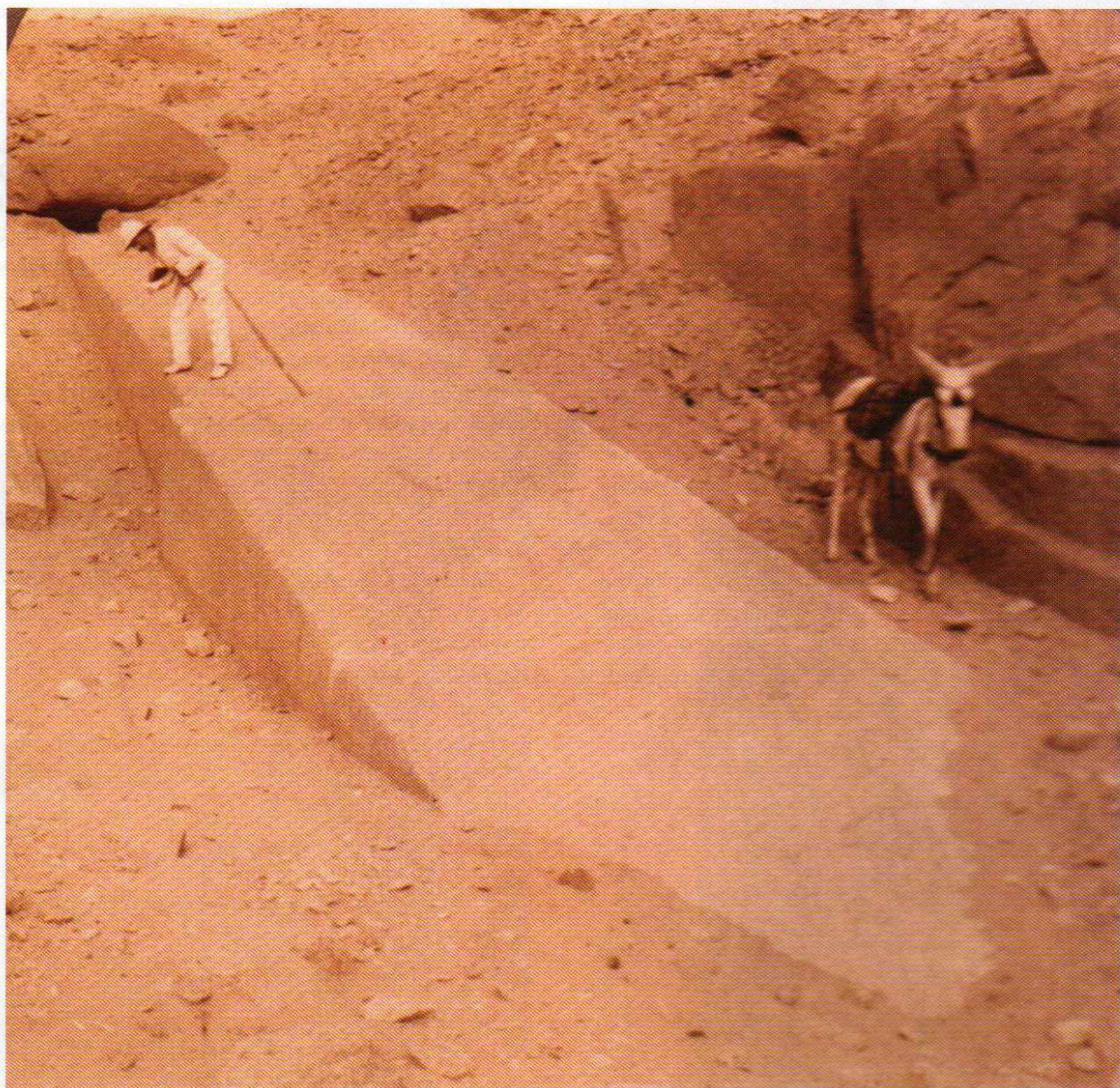


Plus: News from Egypt and much more!

AN OBELISK TOO FAR?

The Unfinished Obelisk at Aswan

*Geologist **Colin Reader** recently paid a single short visit to Aswan, arriving a few hours after sun-rise and leaving in the early afternoon. Visiting the granite quarries and the site of the famous “Unfinished Obelisk”, he considered, from his professional experience, the problems presented in cutting and moving such large blocks of granite.*



The author “Colin Reader” and his donkey, Ramesses, inspect the unfinished obelisk at Aswan. ... Actually, this is an archive photograph of an unknown early tourist and equally unknown donkey, probably taken around 1900, before the obelisk was fully excavated.

For anyone with a background in geology or the construction industry, the site of the Unfinished Obelisk at Aswan presents a story – a story written in the rocks and the quarry faces. If we are able to read it properly, this story will tell us so much about the efforts of the ancient Egyptians to raise monuments to their gods and god-kings, monuments that far surpass in scale and beauty anything that, from our modern perspective, we feel such an early civilisation could achieve with the limited technology available.

Given their architectural achievements, it is perhaps no wonder that so many theories of a supernatural nature have been associated with the Ancient Egyptians. But rather than the need for 'magic', in the rocks at Aswan we can see everywhere the work of the frail hand but strong mind of man.

There is no consensus over the length of time that the unfinished obelisk at Aswan has lain, attached to the granite bedrock, in its quarry at Aswan. Some argue that this huge obelisk, which would have stood some 42m high (without any base) and weighed some 1180 tonnes, may have been commissioned in the New Kingdom, perhaps around the time of great obelisk-builders such as Thutmose I (1504-1492 BC) or Hatshepsut (1479-1458BC). Others suggest a much later date, perhaps Ptolemaic (after 332 BC).

From most available accounts, there would appear to be little doubt over the reason why the obelisk was abandoned – the granite was found to be cracked –

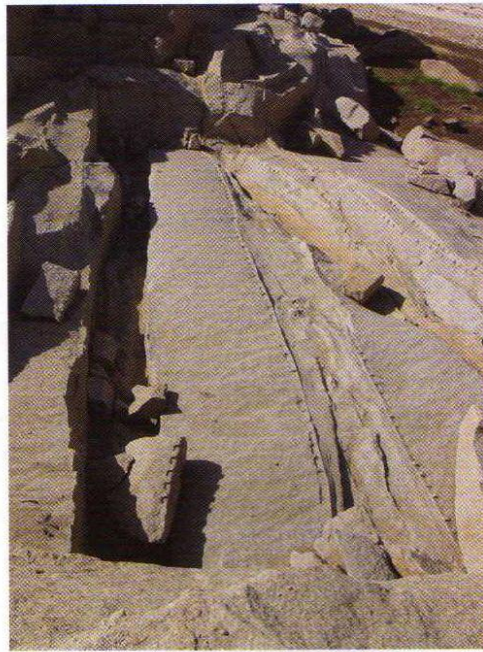
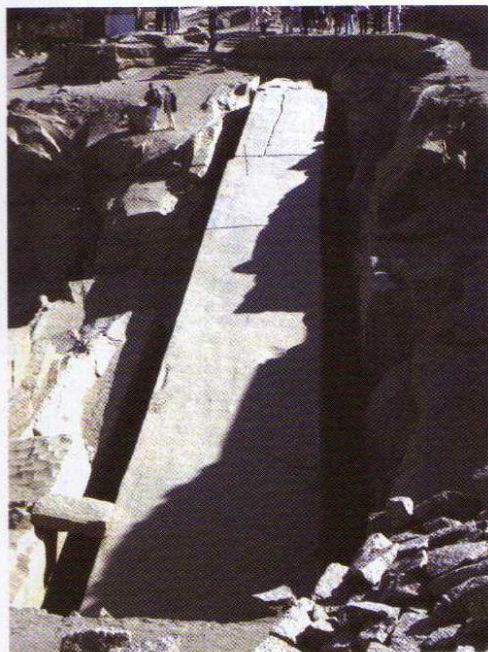
natural fissures in the rock that meant that after all the intense labour expended to quarry the obelisk, the entire project was abandoned.

It would appear, however, that it is not quite as simple as that. From a limited examination of the quarry, it is possible to argue that the Egyptians did not simply 'launch' into the extraction of the Unfinished Obelisk only to be forced to abandon it at an advanced stage. Rather there is evidence of advanced planning and preparation at Aswan, with boreholes sunk to assess the quality of the granite, painted marks for laying out features in the quarry and datum lines for measurement – all techniques no different in principle to those used today. As well as detailed records of the work done, painted on sections of abandoned quarry wall, there are painted animals – birds and fish – and boats, perhaps representing the mascots of the teams of workmen who laboured in the quarries.

The Aswan Quarry

The major feature open to visitors at Aswan – the quarry in which the Unfinished Obelisk sits, was cut into the northern flank of a granite promontory, and it is clear, from even a casual glance around, that this quarry produced far more than just the one Unfinished Obelisk.

The Unfinished Obelisk lies near to the top of the quarry, not too far below the original crest of the hill. Below the Unfinished Obelisk, however, are the scars of numerous other quarried objects, some of which, given the size



Far left:
General View of the Unfinished Obelisk at Aswan (the tip of the obelisk is to the top of the photograph).

Left:
View of scars in the quarry, possibly caused by the extraction of other obelisks.

and shape of the scars they have left behind them, would appear to be other obelisks. It would take detailed survey to establish the precise size of these scars and whether, perhaps, they are the original quarry sites of some of the famous obelisks now scattered around the world.

Constructing an Obelisk – The Quarrying Process

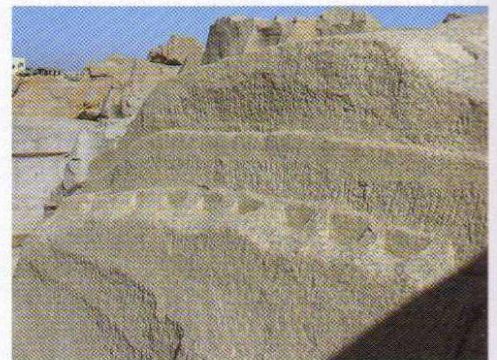
In order to quarry the Unfinished Obelisk, a deep trench was cut to form the outline of the monolith. From the evidence littering the site, it is apparent that for most of the period of working, the granite was quarried by the use of dolerite balls, held in the hand (probably

great deal of useful information.

The use of wedges in quarrying is arguably a more recent technique. The basis for this conclusion is that some researchers have found that wooden wedges, when wetted, do not swell sufficiently to break intact granite, as some early authors assumed. It has subsequently been argued, therefore, that metal wedges were used, indicating a date no later than 500BC for these wedge marks. If this late date for the use of wedges is correct, the abundance of wedge scars at the Unfinished Obelisk site suggests that this quarry was only in use in the later periods of Ancient Egyptian history or perhaps even in more recent times.

Far right:
View of wedge scars, perhaps connected with the extraction of other obelisks at the site.

Right:
Dolerite balls collected during recent excavations in the quarries.



two hands) and repeatedly struck against the exposed rock to gouge out trenches and liberate the required granite blocks. This pounding work has left characteristic scars – most notably in the floor of the trench that surrounds the Unfinished Obelisk itself.

Abundant evidence of fire has been found and it is likely that fire was used in the quarrying process. By lighting fires along the surface of the granite to be quarried and then dousing the fires with water, the exposed granite would shatter, making its removal by pounding far easier.

Inspection of the quarry reveals the scars of other quarrying techniques, with abundant wedge slots and chisel marks. These techniques can perhaps be attributed to different stages of technological development in Ancient Egypt or may represent the use of different techniques in differing circumstances, some techniques perhaps offering more precision than others.

It has long been understood that chisel marks can be dated, using the characteristics of the marks themselves; however, I have not come across any studies of the age of chisel marks at the Aswan quarry. Such a study would provide a

Removing the Obelisk

The issue of the use of differing quarrying techniques is particularly relevant to the way in which the obelisks were separated from the underlying bedrock. Two methods appear to have been used at Aswan, with one technique, that of undercutting the obelisk, probably predating the other.

The undercutting technique used dolerite balls to quarry beneath the obelisk from the base of the surrounding trench. This quarrying was continued until all that connected the obelisk to the bedrock was a thin granite rib. At this stage, levers could be used in the surrounding trench to break this rib and thus free the obelisk. Certainly, this technique was used to remove an object, possibly a small obelisk, which was quarried from a position close to but slightly higher in the quarry than the Unfinished Obelisk. As no attempts were made to free the Unfinished Obelisk, however, the intended technique can only be a matter of guesswork.

For the majority of obelisk-like extraction sites evident in the quarry at

Aswan, there is no rib-scar and it appears that these obelisks were removed by the use of wedges alone. As discussed above the use of wedges is thought to have been a late development.

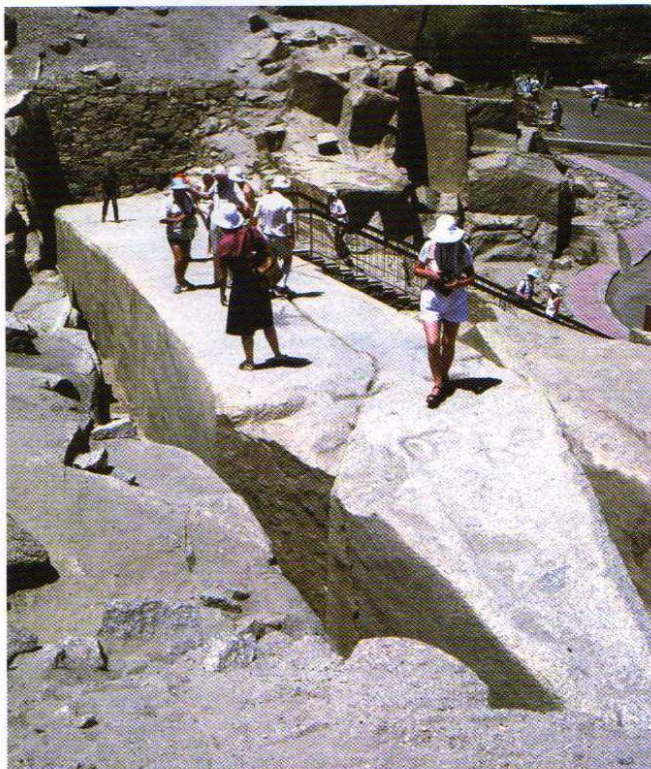
Rebuilding the History of the Quarry?

These ideas and speculations, formed on my brief visit, together with other features of the quarry, do perhaps begin to allow a coherent 'history' of the site to develop.

The Unfinished Obelisk appears to be unique in that, unlike most of the neighbouring obelisk-like scars, it does not lie horizontally in the quarry. The apex of the obelisk sits about 6 or 7m above the base, something that is probably not an accident, but rather the result of careful planning. It may even be that this hill was opened up to quarrying *specifically* for the cutting of the Unfinished Obelisk.

The obelisk lies a short distance below the surface of what was originally a rounded hill. The evidence from the site suggests that the quarry was worked from the top down, but only after the ancient quarrymen had sunk boreholes vertically into the granite from the top of this hill to establish whether the quality of the rock was adequate for the task. The sloping attitude of the Unfinished Obelisk may have been necessary to take advantage of the best quality rock.

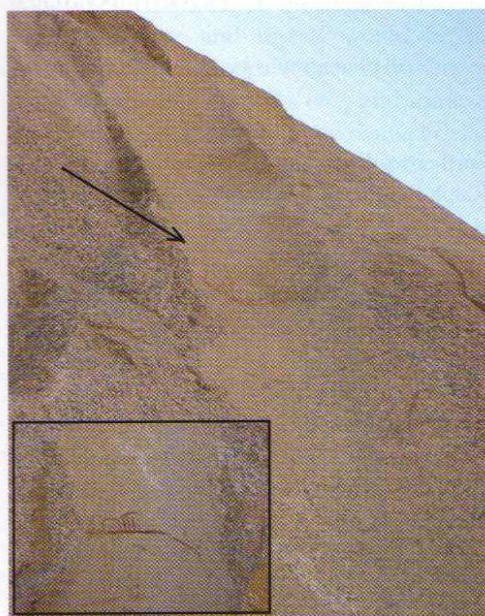
The remains of three boreholes can be seen along the south (uphill) side of the obelisk. They appear to have been taken to depths that correspond with the



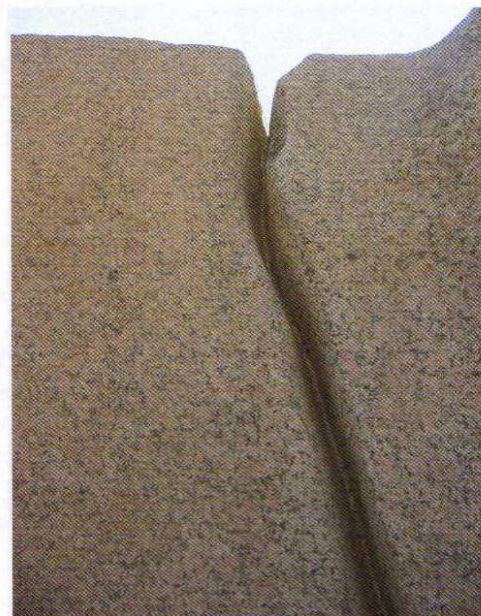
General view of the Unfinished Obelisk at Aswan, looking from the top of the obelisk. The huge scale of the monument can be judged by the visitors walking on its surface.

underside of the Unfinished Obelisk itself and, if this is so, were clearly, therefore, sunk as part of the Unfinished Obelisk project. Most of the boreholes were removed in the quarrying process. However, in one instance, near to the base of the proposed obelisk, part of the borehole walls remain and are painted with a red river boat motif. Only the lowest sections of other boreholes survive.

If we consider an 'evolution' in obelisks, in which each succeeding monolith exceeded its predecessors in height and weight, then it could be concluded that the Unfinished Obelisk was



Far left: Remaining Borehole Walls with red ochre boat (arrowed). Inset, detail of the painted boat.



Left: close up of the unfinished obelisk showing a gouge feature, often, possibly wrongly, thought to be a natural fissure in the granite.

Painted ostriches on the quarry walls at Aswan.

conceived late in Ancient Egyptian history but at a time when undercutting was the technique adopted for the removal of obelisks from the underlying bedrock. Subsequent quarrying from the lower flanks of the hill was undertaken at a time, perhaps after 500BC, when metal wedges were used to extract the granite monoliths.

Project Abandoned?

Was the Unfinished Obelisk abandoned because the granite started showing evidence of cracks – fatal flaws that meant as soon as an attempt was made to lift the obelisk it would break? Well that is the commonly held view and, certainly, there are a number of fissures the cross the obelisk. Close inspection of many of these, however, suggests that they are not natural – they are too wide and rounded and do not penetrate into the mass of the granite. These rounded channels may be more to do with later attempts to break up the Unfinished Obelisk to produce smaller items from the partially quarried granite block.

Some natural fissures are apparent, but many of these appear to be rather superficial – though the ancient quarrymen would have been much better placed, with more practical experience, than a modern geologist, to know if these superficial cracks signalled the end of the project.

It is likely that the Unfinished Obelisk was abandoned, not because of flaws in the granite, but simply because, in this case, the ancient Egyptians overstretched themselves. Despite all the planning and preparation, as the obelisk



neared completion, the quarrymen realised that once freed from the bedrock, it may not have been possible to move this huge piece of granite – perhaps as a consequence of the sloping site of the obelisk. Manpower may have been relatively unlimited, but in the confines of a newly opened quarry, there may have been insufficient space to use the available manpower effectively. So what was intended to be the biggest obelisk Egypt had ever seen was abandoned.

If this assumption is correct, the quarry opened up specifically for the Unfinished Obelisk continued in use for some time, during which other obelisks were produced and attempts were made to break up the Unfinished Obelisk and realise something for all the effort put into its planning and quarrying. All this was to no avail, and today the Unfinished Obelisk remains in its quarry – an item of wonder to us today and the source of so many seemingly unanswerable questions – at least until the site is investigated more closely.

Colin Reader

All photographs by Colin Reader

Further reading:

Ralph Englebach *The Problem of the Obelisks*. 1923.

Two obelisks of Aswan granite which were completed: those of Thutmose I (left) and Hatshepsut (right) still standing in the temple of Amun at Karnak.

