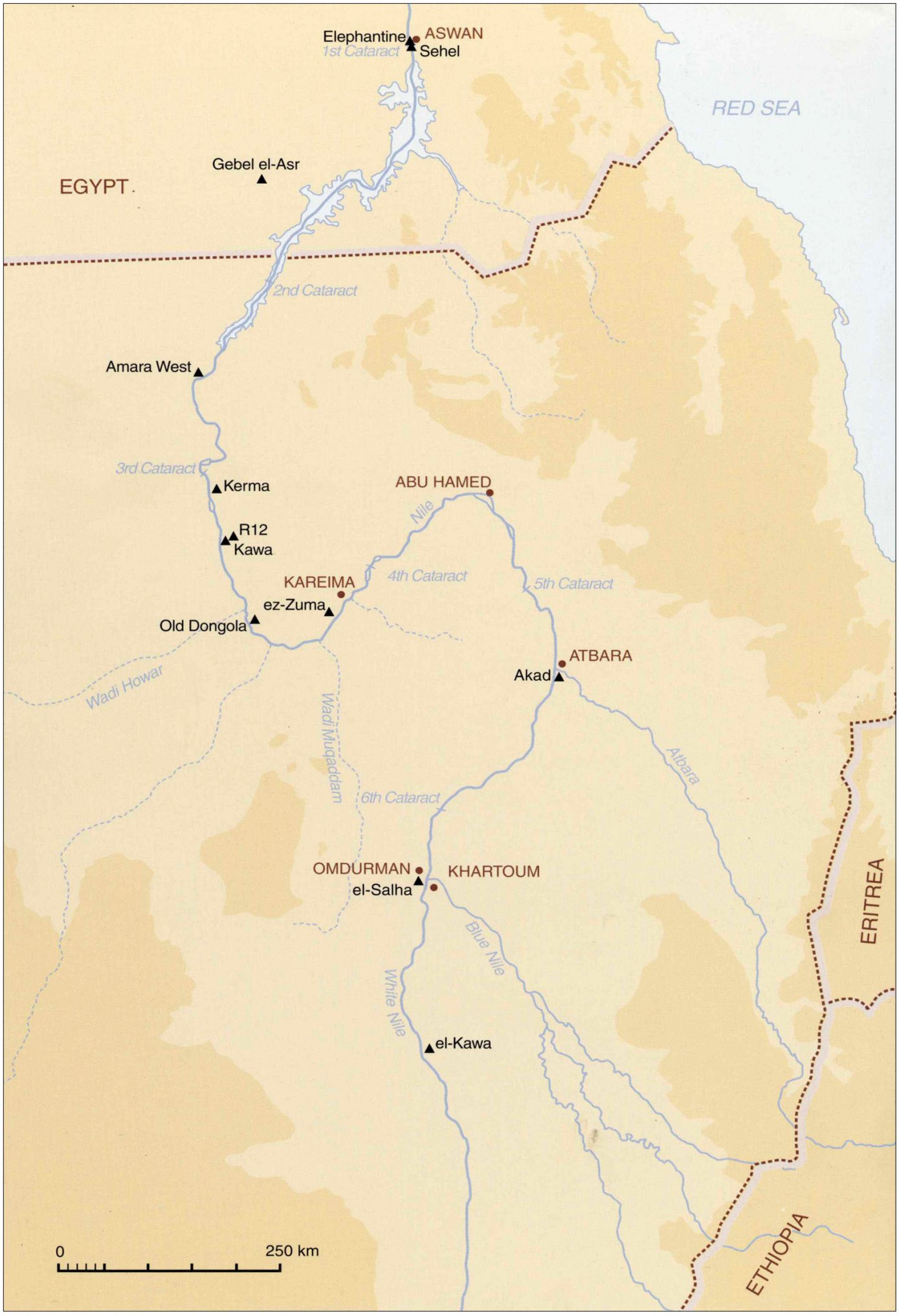
SUDAN & NUBIA

The Sudan Archaeological Research Society

Bulletin No. 6 *2002*


Elephantine
ASWAN
1st Cataract
Sehel
RED SEA
Gebel el-Asr
EGYPT
2nd Cataract
Amara West
3rd Cataract
Kerma
ABU HAMED
Nile
R12
Kawa
KAREIMA
4th Cataract
5th Cataract
ez-Zuma
Old Dongola
ATBARA
Akad
Wadi Howar
Wadi Muqaddam
Atbara
6th Cataract
OMDURMAN
KHARTOUM
el-Salha
ERITREA
Blue Nile
White Nile
el-Kawa
ETHIOPIA
0
250 km

SUDAN & NUBIA

The Sudan Archaeological Research Society

Bulletin No. 6 *2002*

Contents

Front Cover: An apostle from the mural in the chapel at Banganarti containing the king's portrait.

Introduction

Vivian Davies

At the time of writing (mid-September 2002), the 10th International Conference for Nubian Studies has just finished, generously hosted by colleagues in the Università di Roma "La Sapienza". The large number of papers delivered shows how rapidly the subject of Middle Nile studies is growing, with significant advances in knowledge achieved since the last conference held in Boston four years ago, an encouraging state of affairs, to which the content of this present volume bears further witness. There was, however, one hugely important issue which overshadowed the event: the looming crisis of the new dam at the Fourth Cataract.

As reported by the Sudanese delegation, preparatory work for the dam has now begun and actual building will start in two years. It is expected to take a further seven years to complete. In an unwelcome echo of the Aswan High Dam scheme, the reservoir created will flood over 170km of the Nile Valley between the Fourth Cataract and Abu Hamed, enveloping, as we now know from preliminary surveys, thousands of archaeological sites - artefact scatters, settlements, cemeteries and rock-drawings dating from the Palaeolithic to the Islamic Periods. Very little is known about these sites; for the most part only that they exist. Our Sudanese colleagues are urgently appealing for assistance, so that as much as possible of the record may be investigated and documented before the area is lost to knowledge for ever. In response, SARS is this winter launching a campaign of rescue excavation in a region which we recently surveyed (see *Sudan & Nubia* 4 [2000], 51-7), but an extensive international effort will be required if any serious impact is to be made. Our next international colloquium, to be held at the British Museum on 8 May 2003, will focus on the dam emergency. All colleagues with an interest in helping are invited to attend.

Survey at Chephren's Quarry, Gebel el-Asr, Lower Nubia: 2002

Per Storemyr, Elizabeth Bloxam, Tom Heldal and Abdou Salem

Introduction

Chephren's Quarry defines quarry workings that cover an area of approximately 50km² south of Wadi Tushka, 65km northwest of Abu Simbel (Figure 1). A geological investigation of the quarry was undertaken under the aegis of the Egyptian Geological Survey and Mining Authority (EGSMA) in June 2002 by geologists Per Storemyr, Tom Heldal and Abdou Salem and archaeologist Elizabeth Bloxam. The objectives were to study the gneiss deposits and survey (by GPS) the extent of the ancient quarries (Figure 2). This paper gives a brief summary of the survey and also highlights the *acute* current threat to the site by the Tushka land reclamation project.

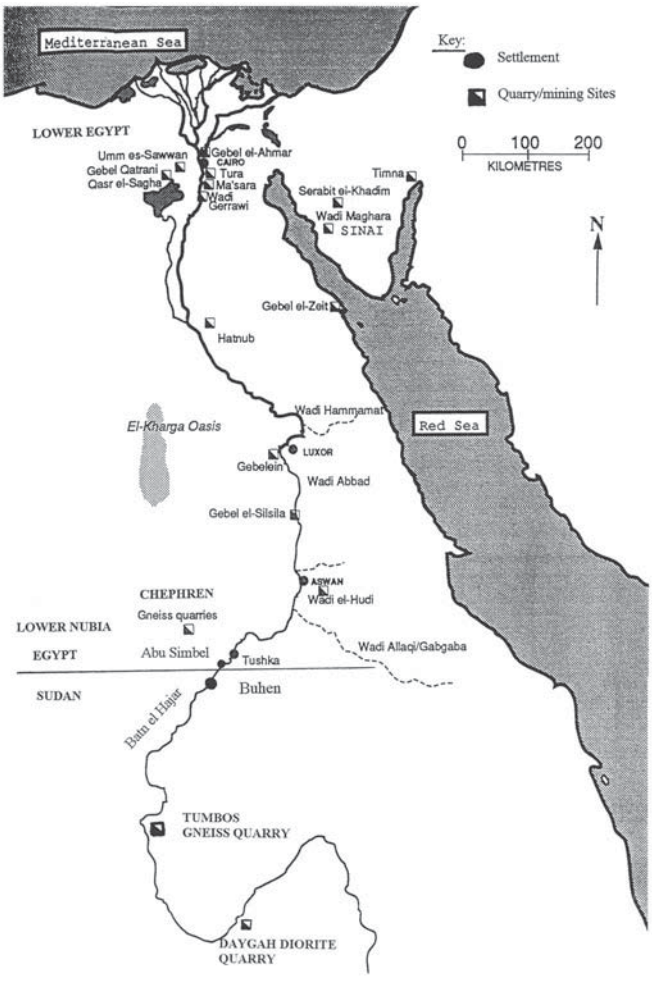


Figure 1. Map of Egypt.

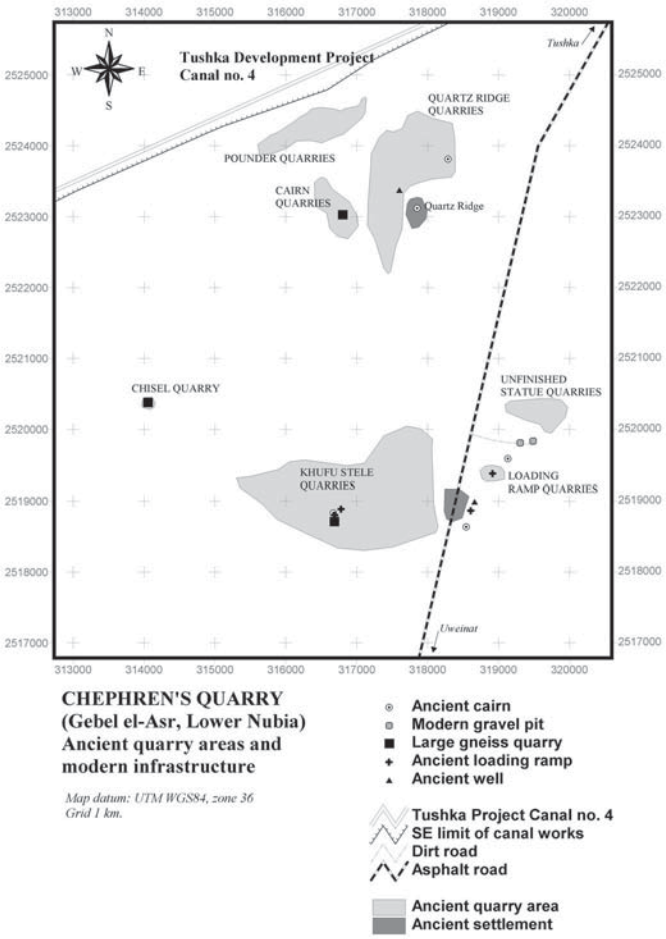


Figure 2. GPS-based map of Chephren's Quarry, surveyed in 2002.

Historical significance

Chephren's Quarry is the only known source in Egypt of the highly characteristic bluish gneisses used for elite funerary objects, particularly during the Old Kingdom. The stone has been classified as 'anorthosite gneiss', 'diorite gneiss' and 'gabbro gneiss' (we will use anorthosite gneiss in this article) and has an appearance ranging from light grey with dark speckled areas to dark and light banded. The main minerals are light grey to bluish white plagioclase and black hornblende. The banded variety was used for the famous 4th Dynasty Khafra life-sized statues (Harrell and Brown 1994, 53), and thus represents one of the oldest uses of stone for statues worldwide. The most intensive period of exploitation occurred during the late 2nd Dynasty into the early 4th Dynasty for stone vessel manufacture, as exemplified by the huge quantities of anorthosite gneiss vessels found in 2nd Dynasty King Khasekemwy's tomb at Abydos and 3rd Dynasty Djoser's Step Pyramid at Saqqara. However, its history of exploitation goes back to the Late Neolithic as revealed from recent excavations of a Middle to Late Neolithic burial site by Schild and Wendorf (2001, 16-17) at Gebel Ramlah, 25km northwest of Gebel Nabta, where a cup made from the stone was found amongst an assemblage of rich grave goods.

Previous work

Engelbach (1933; 1938) and Murray (1939) made the first archaeological and geological investigations of Chephren's Quarry in the 1930's and designated the four main workings as 'Khufu Stele Quarry', 'Quartz Ridge', 'Chisel Quarry' and 'Stele Ridge'. The first three regions are mainly Old Kingdom quarries and 'Stele Ridge' an area of predominantly Middle Kingdom amethyst mining. More recent geological research was carried out by Harrell and Brown in the early 1990's and archaeological survey and excavation was undertaken in 1999 and 2000, directed by Dr. Ian Shaw. During these seasons an area of settlement, a bakery, two stone-built loading ramps and wells associated with the Old Kingdom exploitation were excavated (Shaw and Bloxam 1999; Bloxam 2000; 2001).

Geology

The quarry is situated in a metamorphic basement window surrounded by mainly the cretaceous Nubia sandstone formation (Geologic Map of Egypt 1981, Klemm and Klemm 1993). The basement window is highly complex, and the anorthosite gneiss occurs as irregularly shaped bodies intercalated with granitic gneiss. Numerous dykes of predominantly dioritic rocks intersect the area, and the anorthosite gneiss is at places penetrated by granitic and syenitic veins. The outcrops of the basement rocks are seen as groups of *in-situ* boulders, of which the ones of anorthosite gneiss are soundest and largest (Colour plate XII). The largest observed anorthosite gneiss boulder is approximately 5-6m^3. However, most of the boulders are now gone due to the ancient quarrying, and only waste dumps, work areas with stone fragments and tools, as well as half-worked and discarded blocks, give evidence of the former boulder landscape. Numerous dark pounders found in several quarry areas have their provenance from the local occurrences of dioritic dykes. These dykes formed perfect "toolboxes" for the quarrymen (Plate 1).

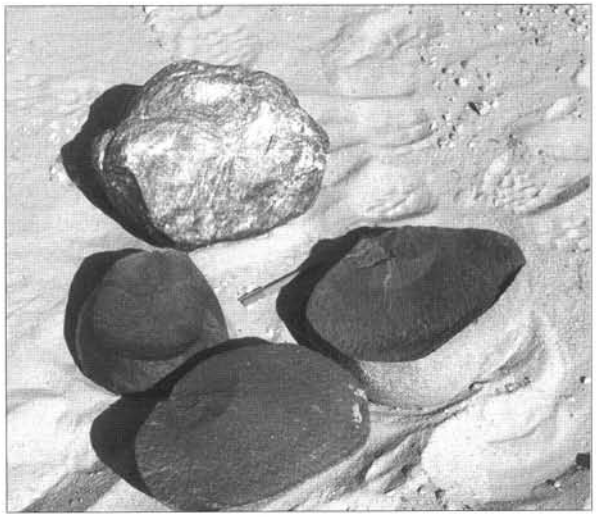


Plate 1. Pounder split in two halves during use.

Quarry areas

In addition to the designated quarry areas, two previously unmapped areas were located to the north-west and south-west of Quartz Ridge during the 2002 survey. They were named "Pounder Quarry" and "Cairn Quarry". Small scatters of pottery date both quarries to the Old Kingdom and 'Pounder Quarry', as the name suggests, revealed extraordinary amounts of dioritic pounders not seen in such quantity at the other quarries (Colour plate XIII). The workings suggest that the quarrymen were mainly after small blocks to be used in vessel manufacture with stone trimming areas being clearly visible.

In addition to these two new areas, another previously known quarry area to the north-east of Khufu Stele Quarry, in which a large half-worked boulder is situated (Murray 1939), was given the name "Unfinished Statue Quarry". Here a previously unknown block of anorthosite gneiss was found that had been partly shaped with pounders(?) into the outline of a seated statue or 'statue blank' (Plate 2). When comparing the size and shape of the block against a completed Khafra statue in the Nubia Museum (Aswan) it seems probable that this was the intended final form. Although there are many examples of stone being worked into rough vessel shapes or 'vessel blanks' at Quartz Ridge, we had earlier assumed that only very rough trimming of large blocks for statuary occurred within the quarries prior to transportation.

Plate 2. Statue "blank" found in the "Unfinished Statue Quarry".

Quarry layout

The layout of the individual quarry areas is quite variable. Khufu Stele Quarry and Cairn Quarry have roughly circular-shaped, highly organised quarries in the middle, about 100m in diameter. Here, the waste has been orderly disposed of in heaps (Colour plate XIV, Figure 3) along the periphery, leaving more or less cleared, now sand-filled areas in the middle. Around these central quarries are large numbers of scattered, small and less organised satellite quarries, mostly representing workings of single boulders or small groups of

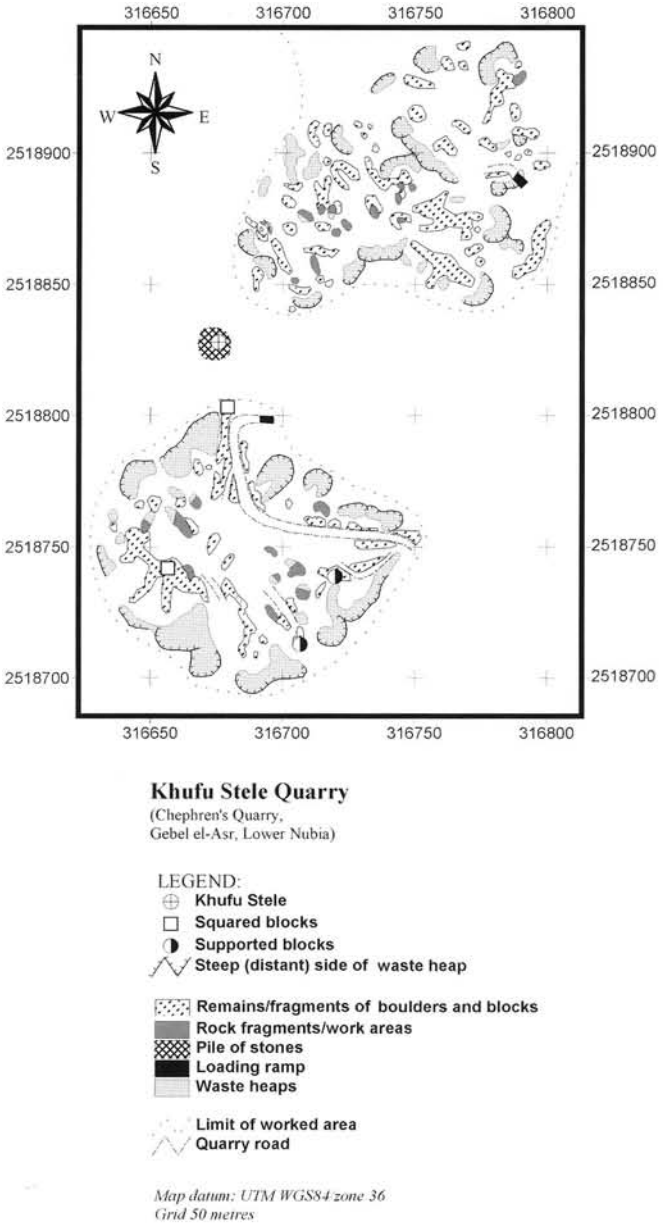


Figure 3. Map of the central quarry, Khufu Stele Quarry.

boulders. Chisel Quarry appears in a similar way, but lacks satellite quarries. Here, quarrying has evidently continued beneath the loose boulders and into the solid bedrock. Pounder Quarry, Quartz Ridge Quarry and Unfinished Statue Quarry consist of mainly single boulder or groups of boulder workings – large quarries are missing here (Colour plate XV).

Two purpose-built loading ramps were previously surveyed and excavated within the environs of Khufu Stele Quarry, the most conspicuous of these ('Main loading ramp') lying between Khufu Stele Quarry and Unfinished Statue Quarry (Shaw and Bloxam 1999; Bloxam 2000). However, in 2002 two more loading ramps were located; the first is close to the ancient settlement east of Khufu Stele Quarry and the second lies within the main Khufu Stele Quarry workings. Since no ramps, nor large, "squared" blocks have been found in the northern quarries (in the Quartz Ridge environs) and the Chisel Quarry, we may suggest that the extraction of stone for statues and perhaps very large vessels (of which one was located in the Egyptian Museum in Cairo in 2002) was concentrated in the south-eastern quarries. However, these quarries were most likely, perhaps formerly, used for small-vessel production. Chisel Quarry seems, however, to have been exclusively used for small vessels, some of which can still be seen lined up for transportation (Colour plate XVI).

Extraction methods

Like predynastic and Old Kingdom *hardstone* quarries in general, Chephren's quarry was mainly worked as a boulder quarry (cf. the Old Kingdom parts of the Aswan granite quarries). It is possible that extraction from bedrock was carried out in the lower parts of the central, large quarries, but here it is likely that open fissures and cracks made the extraction methods very similar to boulder quarrying. This can, however, only be confirmed by archaeological excavations. The boulder quarrying can be summarised by the following working steps:

The relatively loose weathering "crust", consisting of exfoliated scales and in which alteration of feldspar to clay minerals have occurred, was removed, probably with pounders.

Firesetting, as evidenced by small charcoal deposits around many half-worked boulders, was at least partially used to provoke further exfoliation in order to expose the sound core of the boulder. Firesetting was probably used to split boulders as well.

Very rough shaping of split boulder pieces into homogenous blocks for small vessels and larger statuary was probably undertaken with pounders.

As evidenced by the general lack of finely shaped blanks (except for the 'statue blank' [Plate 2] and a few 'vessel blanks' [Plate 3] at Quartz Ridge), and especially blanks destroyed in the production process, further shaping was probably usually undertaken after transportation to special workshops.

The possible transportation methods have been interpreted by Bloxam (2000). Further work on transportation methods is planned, as is excavation of various quarry and settlement features.

The current *acute* threat to the site

It is clear that Chephren's Quarry is a heritage site of unique historical importance that still holds enormous research potential for understanding hard stone quarrying methods, and the logistics and the social organisation surrounding these activities during the 4th and 3rd millennia BC. Therefore, it is with regret that we have to bring to attention the *immediate* threat posed to the site from the current Tushka Project of agricultural land reclamation. This is currently one of the

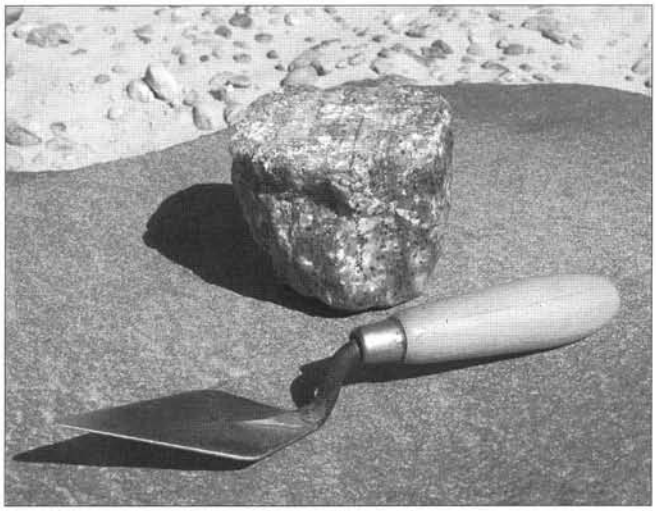


Plate 3. Small, finely shaped blank for a cup at Quartz Ridge.

world's largest land reclamation projects and as such highly controversial from an ecological and economic perspective.

According to various governmental and non-governmental internet resources the Tushka Project was launched in the late 1990s and aims at extending/supplementing the former Sadat Canal, which is a spillway for Lake Nasser that currently creates seasonal lakes in the Tushka region (Plate 4). The new project will bring water from Lake Nasser via the world's largest pumping station and the Sheikh Zayed Canal to four larger Canal branches (1-4 on the map in Figure 4). These canals are supposed to "make the desert green" in this so-called New or South Valley. The project is also associated with large development projects in the western desert oases.

The infrastructure associated with the Tushka Project that commenced with road construction (Abu Simbel - Uweinat road) has already cut through the settlement area by Khufu Stele Quarry and destroyed the amethyst mining area at Stele Ridge. The threat to the rest of Chephren's Quarry cannot be underestimated as survey points were located throughout the area, suggesting that the land reclamation infrastructure will completely devastate the site. The survey points are probably related to Canal 3 of the project (Figure 4). The excavations for Canal 3 have begun at its eastern end, whereas the excavations for Canal 4 are well underway, at places only 200m away from the newly discovered 'Pounder Quarry' (Figure 2, Colour plates XIII and XV). From Figure 4 it is also evident that the whole area in which Chephren's Quarry is located is designated for agricultural development.

We brought this matter to the immediate attention of Dr. Ali el-Asfar, Director of the Supreme Council of Antiquities in Aswan, and submitted a report with a GPS-based map that defines the geographical boundaries of the site. It is our hope that this report will be submitted to the relevant authorities for immediate action to either protect the key elements of the site from this development, or at least provoke some cessation of the work to allow for detailed archaeological and geological investigation to take place as soon as possible.

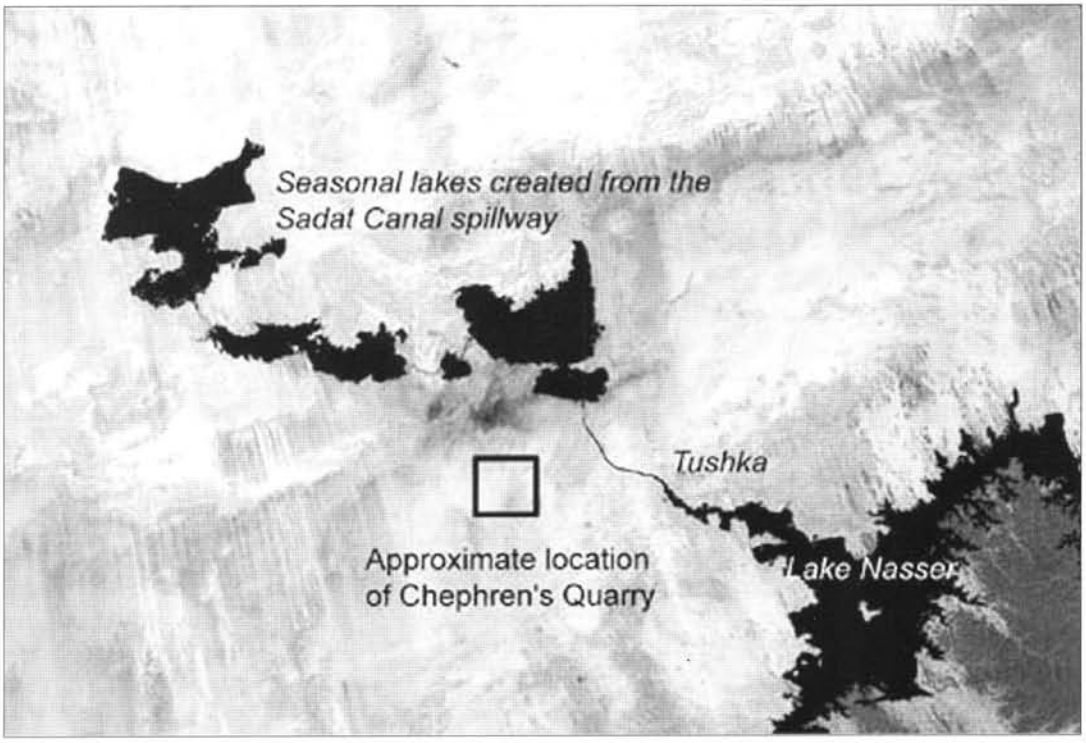


Plate 4. Lakes formed by water from Lake Nasser via the Sadat Canal spillway in the Tushka region in the early 2000s. Landsat image from the US Geological Survey web-site.

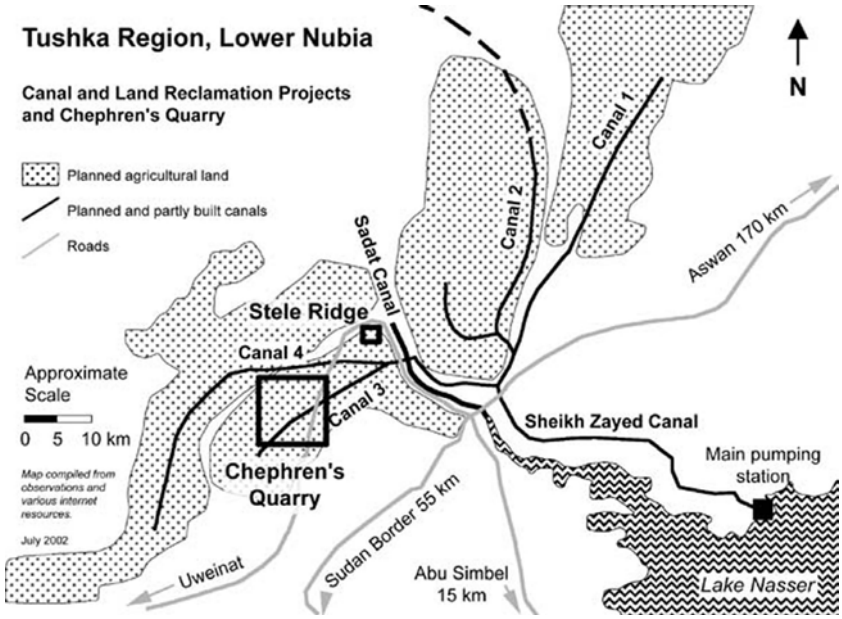


Figure 4. Features of the Tushka Project and location of Chephren's Quarry. Map compiled from observations and various internet sources.

Postscript

A recently received communication from the SCA informed us that action will be taken to protect part of Chephren's Quarry. A visit was made to the site by the SCA in August and after consultation with the contractors of the Tushka Project it was agreed to protect 25 feddans of the site from the Canal 3 development. However, emergency survey and excavation are still planned to take place in early 2003 to document those areas of the site that do not fall within the area being designated as a protected archaeological site.

Acknowledgments

We would like to thank Dr. Ahmed Swedan (President of the Egyptian Geological Survey and Mining Authority, EGSMA) for granting us permission to undertake this work and for his help in the organisation of the project. Thanks also to Mr. Hamdy for getting us to the site and to Mahmoud el-Shendidy for his help in bringing the threat to Chephren's Quarry to the attention of the SCA. For this we are extremely grateful.

Bibliography

Bloxam, E. G. 2000. 'Transportation of Quarried Hard Stone from Lower Nubia to Giza during the Egyptian Old Kingdom', in A. McDonald and C. Riggs (eds). *Current Research in Egyptology 2000.* BAR International Series 909, Oxford, 19-27.

Bloxam, E.G. 2001 (in press). 'The Organisation and Mobilisation of Old Kingdom Quarry Labour Forces at Chephren's Quarry (Gebel el-Asr) Lower Nubia', in *Current Research in Egyptology 2001.* BAR International Series, Oxford.

Engelbach, R. 1933. 'The Quarries of the Western Nubian Desert. A Preliminary Report', *ASAE* 33, 65-80.

Engelbach, R. 1938. 'The Quarries of the Western Nubian Desert and the Ancient Road to Tushka', *ASAE* 38, 369-390.

Harrell, J. A. and V. M. Brown 1994. 'Chephren's Quarry in the Nubian Desert of Egypt', *Nubica* 3/1, 43-57.

Klemm, D. and R. Klemm 1993. *Steine und Steinbrüche im Alten Aegypten.* Berlin/Heidelberg/New York.

Murray, G. W. 1939. 'The Road to Chephren's Quarries', *The Geographical Journal* XCIV, No. 2, 97-114.

Schild, R. and F. Wendorf 2001. 'The Combined Prehistoric Expedition Results of the 2001 Season', *ARCE Bulletin* 180, 16-17.

Shaw, I. M. E. and E. G. Bloxam 1999. 'Survey and Excavation at the Ancient Pharaonic Gneiss Quarrying Site of Gebel el-Asr, Lower Nubia', *Sudan & Nubia* 3, 13-20.

Plate XII. Gebel el-Asr. One of the few anorthosite gneiss boulders left in the quarry area.

Plate XIII. Gebel el-Asr. Typical ancient work area in Pounder Quarry.
Note the excavations of Canal 4 of the Tushka project in the background.

Plate XIV. Gebel el-Asr. Typical waste dump, Khufu Stele Quarry.

Plate XV. Gebel el-Asr. Typical quarry layout at Pounder Quarry. The excavations of Canal 4 of the Tushka project are visible in the background.

Plate XVI. Gebel el-Asr. Trimmed blocks ready for transport, Chisel Quarry.