

QuarryScapes: ancient stone quarry landscapes in the Eastern Mediterranean

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Abu-Jaber, N., Bloxam, E.G., Degryse, P.
and Heldal, T. (eds.)

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Situated far out in the Eastern Desert in Egypt, Mons Claudianus is one of the most spectacular quarry landscapes in Egypt. The white tonalite gneiss was called *marmor claudianum* by the Romans, and in particular it was used for large objects such as columns and bathtubs. Giant columns of the stone can be seen in front of Pantheon in Rome. Photo by Tom Heldal.

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Whatever else happened to the ancient Egyptian quarries?

An essay on their destiny in modern times

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Through selected case studies, this essay describes the fate of ancient Egyptian stone quarries over the last 50 years. It focusses on the many-sided causes of destruction and neglect of these important archaeological sites in an attempt at raising key conservation issues. Such issues are particularly related to how to deal with modern development, such as urban growth and quarrying, which are expected to remain the largest threat for the ancient quarries also in the future.

Introduction

This essay will examine what has happened to Egyptian stone quarries over the last 50 years. Why is this important? It is no secret that Egypt's archaeological heritage in general suffers tremendously from the adverse effects of modern development as well as from neglect, looting and natural decay. This is, of course, not just an Egyptian phenomenon, but Egypt's heritage is particularly vulnerable because of the huge amount of archaeological sites

and the special geography of the country. Much of the deterioration has taken place over the last 50 years or so—a period that has brought unprecedented change to the country. Looking at how ancient quarries have fared in this period may aid conservation because this has to target the many-sided causes of damage and destruction—causes closely linked with political, economic and social issues.

The core part of the essay deals with selected case studies undertaken within the QuarryScapes project and aims at de-

scribing the fate of some important ancient quarries when cities have expanded and modern quarrying has occurred. These case studies have been previously presented in a comprehensive report (Storemyr et al. 2007, including primary references, see also bibliography and other sources at the end of this essay), and are reworked here for the purpose of trying to answer the main question, as seen from the perspective of an interested outsider: is there any hope for ancient Egyptian quarries in the future?

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A vibrant country in trouble

In 2000 professor of economics at the American University in Cairo, Galal Amin, published the English version of *Whatever Happened to the Egyptians?*; a critical but entertaining account of the profound changes, not least in social structure, that have taken place in the country from the 1952 revolution to the present. The book became a bestseller, and in the follow-up *Whatever Else Happened to the Egyptians?* from 2004, Amin took another bemused look at the ‘quantitative’ changes in Egyptian society throughout the same time span—a period in which the population grew from some 20 to nearly 80 million. Amin’s books and many others portraying modern Egyptian society, from novelist Alaa Al-Aswany’s bestseller *The Yacoubian Building* (2004) and historian John R. Bradley’s highly critical *Inside Egypt* (2008), to Ibrahim and Ibrahim’s geographical textbook *Ägypten* (2006), give a picture of a vibrant and multifaceted country, but also a country facing many political, economic and social problems. Large population growth, massive poverty, a widening gap between rich and poor, nearly three decades of emergency law, inflated bureaucracies, endemic corruption and people’s profound dissatisfaction with governing elites are some of the many issues taken up by the authors mentioned above.

Simultaneously, over the last 50 years, tremendous changes in land use have taken place, guided by president Nasser’s (1956–1970) socialist reforms, Sadat’s (1970–1981) ‘open-door policy’ and Mubarak’s (1981–present) continued liberalisation in the economic sector. The profound changes are the results of attempts at relieving population pressures by building new cities and villages, expanding the amount of cultivable land, and making room for industrial and technological development. The High Dam at Aswan (completed in 1971) is the best-known enterprise—a project that wiped out Old Nubia by creating Lake Nasser but secured the agricultural and energy needs of the country. New, celebrated and criticised projects followed in the wake of the High Dam, such as the ‘New Valley’

and Toshka projects, which ultimately aim at turning the Western Desert green across a huge area west of Abu Simbel and beyond.

The use of the fringes of the Nile Valley and even the remote desert is symptomatic of the current land-use development policies. In this partially hyperarid climate, the Delta, the narrow stretches along the Nile River and the environs of a few Western Desert oases are the only places where agriculture could traditionally be undertaken. This special geography implies that 99% of the population uses only about 5% of the total land area of the country. Driven by population growth, there thus seems to be little else to do than put the desert to use, though critics would maintain that Egyptians may never be willing to move into the desert in great numbers. Crowded Cairo, one of the world’s largest cities with an estimated population of some 20 million, has expanded 35 km into the Western Desert in the course of 30 years, but (for many reasons) outlying areas still remain virtual ghost towns. Also substantial cities, such as New Minya, New Asyut and New Aswan, pop up in the desert adjacent to Nile Valley and agricultural schemes expand into almost every sizeable flat-lying tract of land outside the fertile Nile floodplain. Mining, quarrying, petroleum production and new roads round off the picture of a country in which the desert is no longer as serene as it used to be. It is also increasingly traversed by some of the almost 13 million tourists that visited the country in 2008 (an all-time record), though most of these spent resort holidays along the Red Sea coast or visited mainly the classical monuments in Giza, Luxor and other places. Tourism is the most important source of foreign revenue and sprawling new hotels and resorts litter the Red Sea coast, the Mediterranean shoreline and main tourist centres in the Nile Valley. A mixed blessing, the tourist industry means work for many, but also increasing differences between rich and poor and an undermining of traditional ways of life. Also, the sprawling luxury resorts are an immense contrast to the harsh realities of everyday life for most Egyptians.

Heritage management and ancient quarries

What has all this to do with ancient quarries or, for that matter, any other type of cultural heritage in Egypt? A simple, general answer is that the destiny of cultural heritage, or its status in terms of condition, legal protection and conservation, reflects the political, economic and social development of a country, including the rapid changes in land use. First, Egypt has a staggering amount of archaeological sites—the entire Nile Valley, its desert flanks and many remote desert areas are practically a continuous series of archaeological landscapes, which almost everywhere include ancient quarries, some of very great lateral extent. This means that there is an almost unavoidable conflict between preservation and modern development, and that the poorer-known (and, hence, unprotected) sites may be destroyed or their environs at least heavily impacted by almost any kind of development project.

Second, though the problems of destruction of archaeology generally is thoroughly recognised by the Supreme Council of Antiquities (SCA, the cultural heritage authority of Egypt, part of the Ministry of Culture), conservation and management efforts have traditionally been directed towards monumental heritage (pyramids, temples, tombs, some settlements), which are admittedly also much needed. Non-monumental sites, where tourists seldom venture, are given lesser priority, which is not surprising because it is often difficult to recognise, let alone communicate, the significance and value of such sites. And most have little potential for tourist revenue, at least in comparison to a pyramid. Hard to ‘see’, such sites may be large, complex and sometimes remote, which implies that their conservation demands special competence and is often costly in terms of survey, monitoring and management. Such competence and basic resources (e.g., survey equipment, cars) are generally lacking at the local/regional heritage preservation offices, and thus foreign missions usually aid in such matters, but

of course, only at those sites where they have special interests.

Third, most Egyptians have considerably more acute everyday problems than caring about such archaeological sites. At the bottom line, comparatively well educated heritage inspectors are so underpaid (like elsewhere in the state sector) that many are more concerned with making ends meet by taking or seeking additional jobs than monitoring threatened sites, for which there is anyway few incentives at the local level.

In consequence, a significant proportion of poorer-known archaeological sites, including ancient quarries, remain more or less neglected. In theory, for all sites older than a hundred years, there is strong protection under the Antiquities Law (last revised in 1983), but in practice there is often little or no control in terms of directing developers (and looters) away when they enter an area of archaeological remains with picks and shovels, bulldozers and dynamite. This is certainly not to say that the authorities are doing nothing. There have been many positive changes in recent years, including compulsory conservation of excavated sites by those responsible for the digging, a ban on new excavations (except rescue excavations) in the Nile Valley (this as a way of putting a higher focus on archaeology in the Delta and on conservation), promotion of field schools and training courses, and the building of new storage facilities for excavated artefacts and construction of new museums. In addition, there is a stronger tendency than before on 'nationalising' the heritage or encouraging greater professional Egyptian involvement with it, which also includes a focus on the return of (stolen) artefacts from abroad. This is, in the end, a heritage that traditionally, as a result of the colonial era, has been the playground for foreign expeditions and adventurous collectors.

However, many of these initiatives are not particularly helpful for conservation and management of little-visited ancient quarries and other non-monumental sites spread across the landscape. Therefore, for such sites the establishment of the EAIS (Egyptian Antiquities Information

System, a part of the SCA) for making, maintaining and publishing an official country-wide site inventory, as well as a small SCA department for actually putting the ancient quarries on the conservation agenda, have been of greater importance. To this we shall return later.

Overall condition of ancient Egyptian quarries

A recent QuarryScapes analysis showed that among the approximately 200 known ancient quarries of mainly Pharaonic to Roman date about 10% are entirely or largely destroyed (including those now under Lake Nasser), 20% are partially destroyed, 38% are largely intact and 26% are still in relatively good condition, with the state of the remaining 6% unknown. Those still in good condition (except for minor or, in some cases, major looting) are principally located in the Eastern Desert, including Mons Porphyrites and Mons Claudianus, and in some places along the Nile in Middle Egypt (Figure 1). Not surprisingly, the main reason for destruction—and probably the greatest direct future risk—is modern quarrying (good stone doesn't change its location!), to which about 40% of the quarries have been subjected. About 11% are directly influenced by urban and rural development, with agricultural development accounting for a mere 2% since ancient quarries are normally situated in elevated places that cannot be used for agriculture. However, the latter threat is a main risk for prehistoric quarries (pre-3,000 BC), especially Palaeolithic ones used to produce flint tools. For a number of quarries the exact nature of modern impact could not yet be specified.

These figures may not at first glance seem particularly dramatic. However, they do not consider developments that have taken place in the immediate environs of the quarries, which in many cases have thoroughly obscured their archaeological and natural context. Moreover, bearing in mind that only about 6% of the quarries have a secured, legal protection status as owned or supervised by the SCA, the situ-

ation can be regarded a great deal worse, notwithstanding the fact that >10% are part of other legally protected archaeological sites, many more are known by the heritage authorities, and that three quarries are developed (or under development) for visitors. Typically, the latter are some of the most 'monumental' ancient quarries in Egypt: the Unfinished Obelisk in Aswan, Gebel el-Silsila near Kom Ombo and Serabit el-Khadim in Sinai. The failure to properly register ancient quarries, and thus to make public that 'this is archaeological land', is understandable in view of the developments in the country and the authorities' lack of resources; but clearly one of the greatest risks facing this group of cultural heritage sites is the ignorance of developers who do not recognise the historical significance of a place that is marked on no map and not communicated as being of special value. For legal protection measures to be undertaken, inventories first need to be made and this has been a high-priority task in the QuarryScapes project. Though there is a long way to go from a record in a database to efficient protection and conservation, all known ancient quarries are now listed in the SCA/EAIS databases.

Natural hazards and erosion may seem of minor importance compared to the man-made risks. And this is certainly true for most quarries along the Nile Valley, with the exception of spectacular, deep gallery quarries that have already collapsed or may collapse in the future. Also weathering away of tool marks and inscriptions is problematic at some places. But perhaps the greatest natural risks are connected with rare rainstorms and flash floods, especially in the Eastern Desert where quarry infrastructure such as habitation sites, slipways and roads are frequently washed away. Moreover, the occasional earthquake has taken its toll at some sites.

Three areas with numerous ancient quarries, spanning the entire course of Egyptian history (and parts of its prehistory), are under particularly high pressure from modern development. These are the greater Cairo area, and the environs of El-Minya and Aswan. In these areas it is

The State of the Stone Quarries of Ancient Egypt

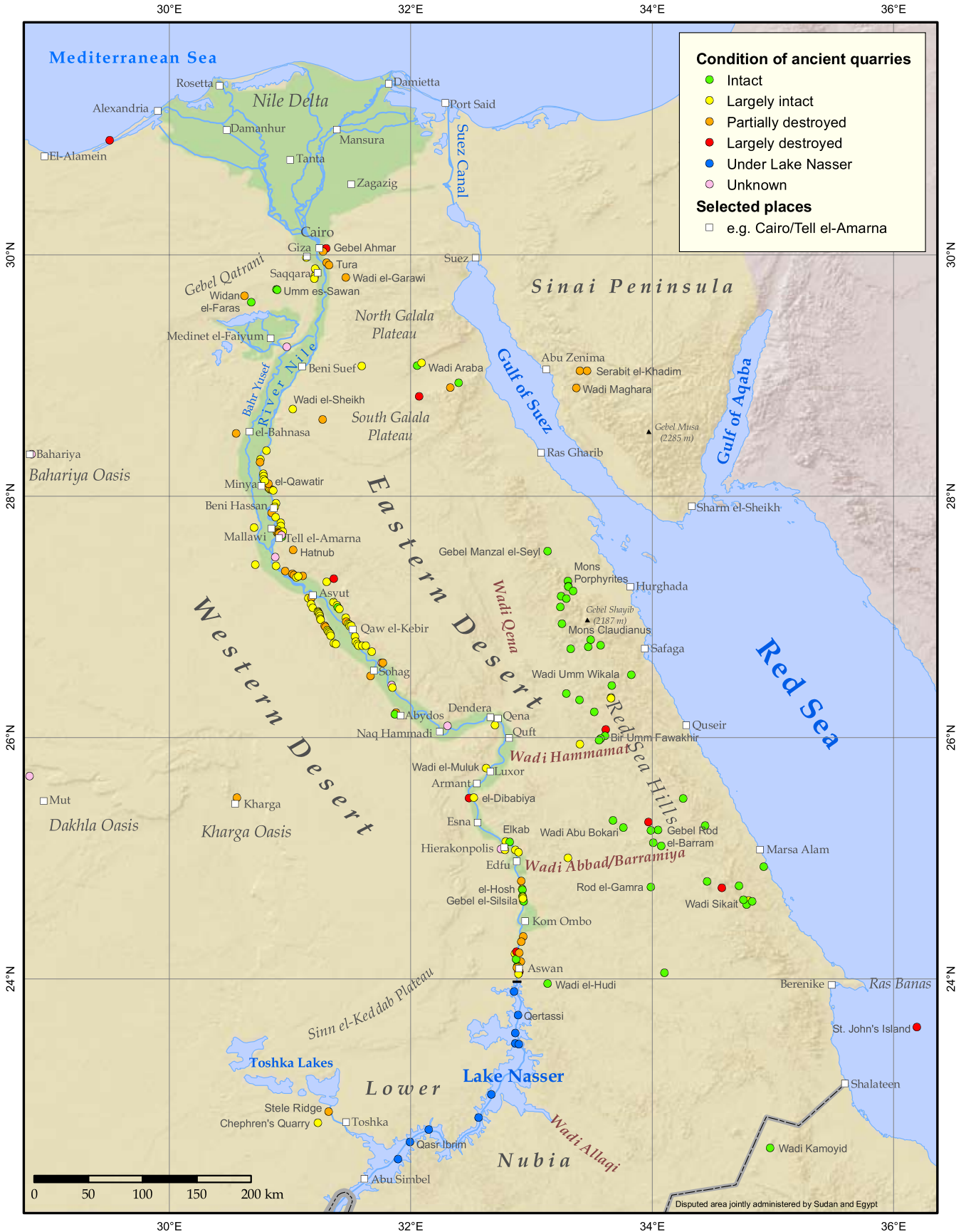


Figure 1. Overview of known ancient Egyptian quarries and their tentative condition. The quarries mainly date from the Early Dynastic (ca. 3100 BC) to the Roman Period, with a few Islamic Period quarries also included. Map: the QuarryScapes project/Per Storemyr and James A. Harrell.

industrial, urban and agricultural development, which spark off chain reactions of secondary developments such as quarrying and road building, that are responsible for the critical situation, as seen from the perspective of ancient-quarry protection. Some of these developments are presented as case studies below.

From ancient quarry to swimming pools and football stadiums

Flying over Cairo on a smog-free day is an experience. Coming in from Upper Egypt one may skirt the green Faiyum, enjoy all the pyramids from Hawara to Giza, turn east over the Nile, pass the Citadel and, if lucky, see a red spot surrounded by sports stadiums and swimming pools in the urban jungle before landing close to Heliopolis in the eastern outskirts of the city (which are not the outskirts anymore, given that the city now extends halfway to Suez). The red spot is Gebel el-Ahmar (meaning ‘the red mountain’), once an extraordinarily important ancient quarry (Figures 2–6). From here, hard, red and brown silicified sandstone (or quartzite), with strong symbolic connections to the solar religion of ancient Egypt, was procured for fine statues and architectural elements.

Gebel el-Ahmar is not marked on maps of Cairo anymore. It has been renamed Gebel el-Akhdar, meaning, quite ironically, the ‘green mountain’ and obviously referring to its now terraced slopes. It is now squeezed between Medinet Nasr to the east, where building of residential areas commenced under Nasser’s regime, and Manshiet Nasser to the west, where 600,000 people live in Cairo’s largest squatter settlement initiated in the 1960s within and around the ancient, medieval and modern Moqattam Hills limestone quarries. Gebel el-Ahmar itself is entirely built over by Arab Contractors, a most influential construction company established in the 1950s and at times the largest of its kind in the Middle East. It also built the High Dam at Aswan. The area was formerly used by the military, but the company’s hospital was established here in the 1970s. A large sporting club followed (Figure 5), and today one may join tens of thousands of fans watching Arab Contractor’s Premier League football club play at their own stadium here. Or one may sip a Turkish coffee in the café at the highest point of the hill by a prominent modern building (apparently a casino completed already around 1980) clad with the fine quartzite from the quarries, which were also active in modern times (according to Baedeker’s 1885 travel guide providing stone for e.g., millstones and road

construction). Many more companies reside in the environs; there is another large stadium nearby and construction still continues within the boundaries of the former quarry.

The ancient quarry was occasionally visited by scholars throughout the 20th century and though important finds were made (Figure 6), it was never really surveyed and documented. There seems to be no reports on efforts at protection and conservation, and it would be difficult now to properly reconstruct what really happened back in the 1950s and 1960s when plans for the use of the area must have been originally laid down. And it would by all means have been hard for any kind of cultural heritage authority to save this prominent hill with non-monumental archaeology in such an incredibly sought-after area. Whether archaeological traces remain at Gebel el-Ahmar is unlikely, but since the area still awaits a survey there may be surprises by the swimming pools and tennis courts.

Basalt for pyramids and railway construction

As an archaeological site Gebel el-Ahmar may be dead, not only because the quarry itself is largely gone, but also since its context has drowned in the urban jungle. Turning to the other side of Cairo,



Figure 2. Ancient Gebel el-Ahmar silicified sandstone quarry (red circles) around 1825 and by the 1880s as the city of Cairo had not yet started its modern expansion. Maps from the online version of *Description de l'Égypte* by Bibliotheca Alexandrina (<http://descegy.bibalex.org>) (left) and *Baedeker's 1885 Handbook for travellers for Lower Egypt* (online at <http://scholarship.rice.edu/handle/1911/9163>) (right).



Figure 3. Cairo and its eastern outskirts in 1965 (above) and 2000 (below) with approximate outline of the ancient Gebel el-Ahmar silicified sandstone quarry. Satellite images: 1965–US declassified (Corona); 2000–Landsat.



Figure 4. Ancient Gebel el-Ahmar silicified sandstone quarry in 1965 (above) and 2007 (below). Quarry outline is approximate. Satellite images: 1965–US declassified (Corona); 2007–Google Earth (Spot).



Figure 5. View from the top of Gebel el-Ahmar, looking south towards part of the Arab Contractor's Sporting Club. Note the red rock which gave the hill its original name. Photo: Per Storemyr 2005.



Figure 6. Gebel el-Ahmar: Excavation of an abandoned colossal statue in 1989. The insert picture shows the situation in 1991. Photos: James A. Harrell.

in the Western Desert 50 km beyond the pyramids of Giza, the situation is still very different (Figure 7). On Gebel Qatrani, at 350 m above sea level and on the highest point in northwestern Egypt, lies Widan el-Faras, a basalt quarry which in a sense can be regarded as the 'sister quarry' of Gebel el-Ahmar; the two quarries are the only known heavily exploited ancient sources of hardstone relatively close to (but outside) the Nile Valley between the Mediterranean and Aswan—and they both rose to prominence in

the pyramid age of the Old Kingdom. Until a few years ago Widan el-Faras, strikingly located on a black-coloured escarpment with views to the Faiyum, had been untouched since antiquity. This is not to say its environs had remained unexploited; since the basalt deposits between Gebel Qatrani and Giza are suitable for building purposes, and are unique in the region and considered a national strategic resource, they were put to use as sources of crushed stone for railway and road construction, probably around 1960. A large project for which the stone was used was the 350 km-long railroad, finished in the early 1970s, between the iron-ore mines in the Bahariya Oasis and the prestigious iron and steel factory at Helwan near Cairo. The factory was established with Soviet aid in the late 1950s and in the early years was supplied with ore from Aswan. The railroad runs just to the north of Gebel Qatrani.

State-owned and private basalt-quarry companies (that also deliver blocks for coastal erosion protection) gradually

closed in on the ancient quarries. In 2002, work aiming at establishing a new quarry in the midst of the Pharaonic workings was underway, and since then about 30% of the old quarries have been eradicated (Figure 8). However, large-scale modern production has not yet commenced. This is because of intervention by the heritage authorities reacting to pressure from scholars (mainly QuarryScapes) who have surveyed the quarries, as well as others involved with nature conservation. Gebel Qatrani is part of Lake Qarun Nature Protectorate, which was established in 1989 and is administered by the Egyptian Environmental Affairs Agency (EEAA). In theory, it is forbidden to undertake modern quarrying, mining and the like inside a nature protectorate without a special permit. Moreover, because of its fossil deposits—and its archaeology—this area is now forwarded as a potential World Heritage Site. For the time being, quarry companies have retreated from the ancient quarries (extraction licences have not been renewed by the responsible gov-

ernorate), but heavy activity is going on as before in the immediate environs. A call has been made for permanently securing the protection of the quarries by the SCA, but the outcome is still uncertain.

The ancient road from the quarries—4500 years old and thus the oldest paved road in the world—traverses a still rather pristine part of the Northern Faiyum desert and ends at an ancient harbour, now on dry land, by Qasr el-Sagha, 12 km to the south. In this area other problems of modern expansion start, as the attractive northern shoreline of nearby Lake Qarun is planned for up-scale residences and tourism. Accompanying this development will be destructive road building, the churning up of unregistered archaeological sites due to construction activities, and a massive influx of people into this fragile environment—notably within the Lake Qarun Nature Protectorate. Much is already destroyed a few kilometres further east in the archaeologically exceptionally important Kom Aushim area, where several archaeological missions work, but where extensive modern clay mining and land reclamation for agriculture have gone on for decades. The agricultural development appears to be slow in this area, but is moving northwards and may in the future threaten the Umm es-Sawan Old Kingdom gypsum quarries.

Then there are the desert tourists. With the Northern Faiyum desert becoming increasingly squeezed between the western outskirts of Cairo and the development zone of Kom Aushim, modern roads and tracks now criss-cross the area and make it easily accessible for day-trip tourists in their 4WDs. The ancient quarry road from Widan el-Faras is being adversely affected by this traffic and some people do not seem to refrain from stealing whatever kind of artefact they come across, from flint tools to pottery fragments. This is a trend that affects large parts of the Western Desert and, in consequence, will make it difficult for professional archaeologists to interpret sites in the future.

Fortunately, attempts at counteracting the adverse effects of desert tourism

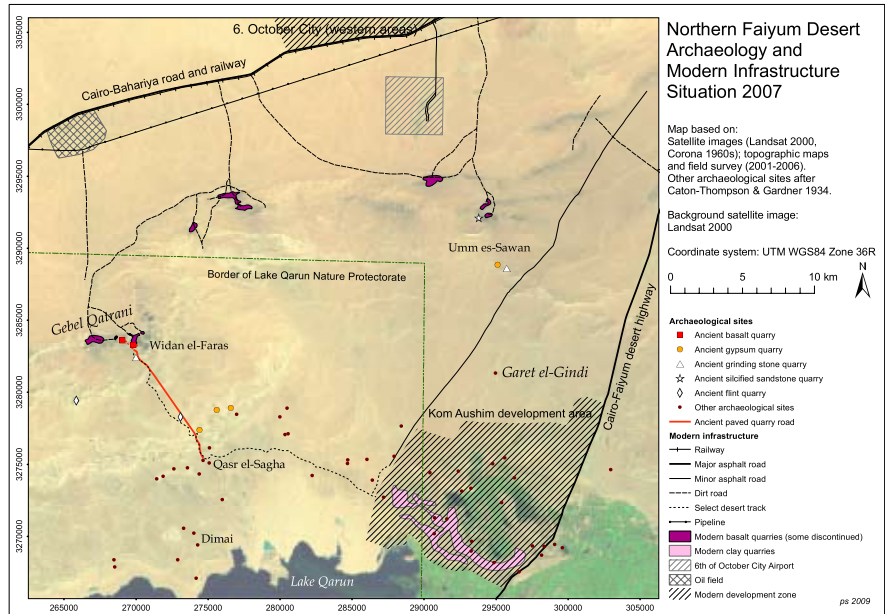


Figure 7. Archaeology and modern infrastructure in the Northern Faiyum desert as of 2007. Map: the QuarryScapes project/Per Storemyr. Background satellite image: Landsat 2000.



Figure 8. Part of the ancient Widan el-Faras basalt quarry in 2001 (above) and 2007 (below), after initial work to open a modern quarry. Photos: Per Storemyr.

on both archaeological and fossil sites in the Northern Faiyum are currently underway by the local EEAA office responsible for the Lake Qarun Nature Protectorate. For example, the office has marked access tracks and natural/cultural sites, aiming at informing visitors and in this way reducing the risk of destruction by looting and careless desert driving.

Chephren's quarry and the Toshka project

Increased looting has also been observed a thousand kilometres to the south, at Chephren's quarry in the Western Desert, 60 km west of Abu Simbel. This is, however, rather unimportant as compared to other threats facing these 50 km² of flat desert with 700 small Old Kingdom quarries that produced a beautiful bluish gneiss. Chephren's quarry is in the midst of the Toshka megaproject (Figures 9–10), second only to the High Dam at Aswan in ambition and cost. The project is part of a decades-old vision of making a Nile-parallel 'New Valley' (Wadi el-Gedid) running from Toshka through the Western Desert oases almost to the Mediterranean, using water from Lake Nasser and groundwater from the Nubian aquifer. This, according to its supporters, would relieve Egypt from many problems with overpopulation and food production. Sceptics, on the other hand, point out that the project will lead to severe environmental impacts and may fail due to increased use of Nile water in Sudan and Ethiopia.

Hyperarid and burning hot, this area was remote and pristine until the 1970s when the water level of Lake Nasser began to rise after the completion of the High Dam. Like hundreds of archaeological sites along the new lake, part of the ancient track from Chephren's quarry to the Nile drowned in this period. In the late 1970s, construction began on the Sadat Canal, a spillway draining into a series of large, natural depressions in the desert. Following exceptionally high water levels, overflow from Lake Nasser through this canal was first observed in

the late 1990s and since then three large lakes (the Toshka Lakes) have formed. They have shrunk in recent years, but still occupy an area of more than 1000 km².

The Sadat Canal did not have great impact on Chephren's quarry itself, but the nearby Stele Ridge carnelian quarry of Middle Kingdom date was adversely affected. However, it was not before the construction of the new asphalt road to distant Uweinat in the 1990s that this gemstone quarry became severely damaged during digging for gravel. Similar destruction took place in Chephren's quarry; the road passes right through an associated settlement site and literally divides the ancient quarry area into two parts. The Uweinat road is an element of the Toshka project, for which the first concrete plans were presented in the early 1990s. Construction commenced in 1997 and the first phase has involved the excavation of a more than 150 km-long canal network for supplying the planned agricultural schemes. These canals, two of which are now in operation (Canal 1 and 2), are fed through the 50 km-long Sheikh Sayed Canal and the giant Mubarak pumping station at Lake Nasser. According to the original plans, the whole of Chephren's quarry and Stele Ridge should already have been bulldozed, covered with topsoil and now producing cash crops for the international market. Moreover, the planned Toshka city should have been the home of thousands of people coming from the Nile Valley. However, apparently due to economic problems, since 2003–2004 the project has come to a partial standstill. By Canal 1 and 2 a few farms have sprung up, but the unfinished Canal 4, which cuts through marginal areas of Chephren's quarry, as well as Canal 3, are left as huge scars (several hundred metres wide) on the desert surface. This means that many parts of the quarry landscape, though surrounded by roads and unfinished canals, remain reasonably well preserved (as observed in 2007).

In the late 1990s there were some attempts by heritage authorities at putting Chephren's quarry and the nearby Naba

Playa Neolithic sites (60 km west of Chephren's quarry) on the agenda for conservation and associated desert-tourist development—attempts partially related to the influx of tourists that come to see the famous Abu Simbel temples, less than an hour's drive away from Toshka. For unknown reasons, these attempts were not followed up and since then practically nothing has happened in terms of protection. The archaeological missions that have recently worked at Chephren's quarry in 2002 called upon the heritage authorities to take action and officially protect the quarry area, but in 2007 it was learned that the plans developed had '*disappeared within the bureaucracy*'. Following new requests, further plans for action may be underway but, again as with Widan el-Faras, the outcome is uncertain. Evidently, if no action is taken, there is an acute risk that a unique archaeological site will be wiped out as soon as (or if) canal building and land reclamation resume.

Ancient quarries, modern industries and a new city

By the first Nile cataract and the High Dam are the Aswan quarries, an assemblage forming one of the largest, longest-lived and most complex quarry landscapes in the world. Exploitation was based on two easily available, special resources—hard silicified sandstone (quartzite) and granite (plus the closely related granodiorite)—but also on normal, soft sandstone. Spread out across more than 100 km² on both banks of the Nile, the quarry landscape covers almost the entire history of humankind, featuring everything from Palaeolithic tool workshops, massive grinding-stone industries, quarries for sculpture and building stones, to the most famous of all quarries in Egypt, the Unfinished Obelisk quarry of New Kingdom date (Figure 11). This is the only officially protected quarry in the Aswan area and it is also part of a World Heritage Site, the 'Nubian monuments from Abu Simbel to Philae'. There are also ancient

iron and ochre mines, and presumably ancient clay mines in addition to, of course, many other archaeological sites in this traditional border- and trade region between Upper Egypt and Nubia.

The complex ancient quarry landscape has an equally complex history of modern impact (Figures 12–14). There is minimal place for agriculture along the narrow Nile floodplain, and with some justification one may portray Aswan as an ancient industrial region that over the past century has been revitalised. Throughout the Middle Ages and early modern era Aswan lost much of its former importance, but was ‘rediscovered’ by tourists and developers, gaining momentum from the building of the original Aswan Dam (or Old Dam) between 1897 and 1902, subsequently raised twice until 1934, and finally being developed into a modern industrial, tourist and administrative city over the last 50

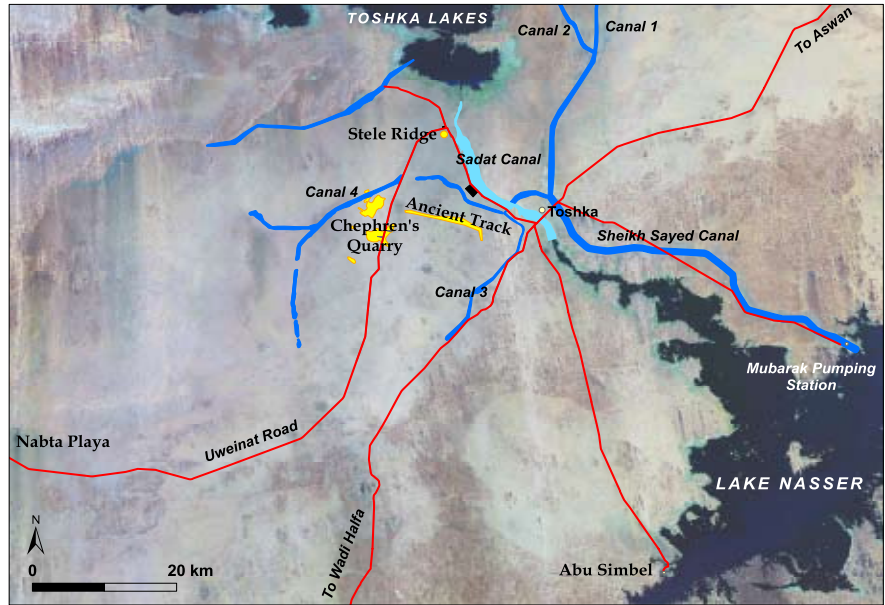


Figure 9. Chephren's quarry and the Toshka project area with modern roads (red) and canals (blue). Status in late 2007. Map: the QuarryScapes project/Per Storemyr. Background satellite image: Landsat 2000.

years. Still, population grew slowly in the beginning, from less than 15,000 a hundred years ago to about 30,000 before

President Nasser started the building of the High Dam (completed in 1971). Now there are somewhere between

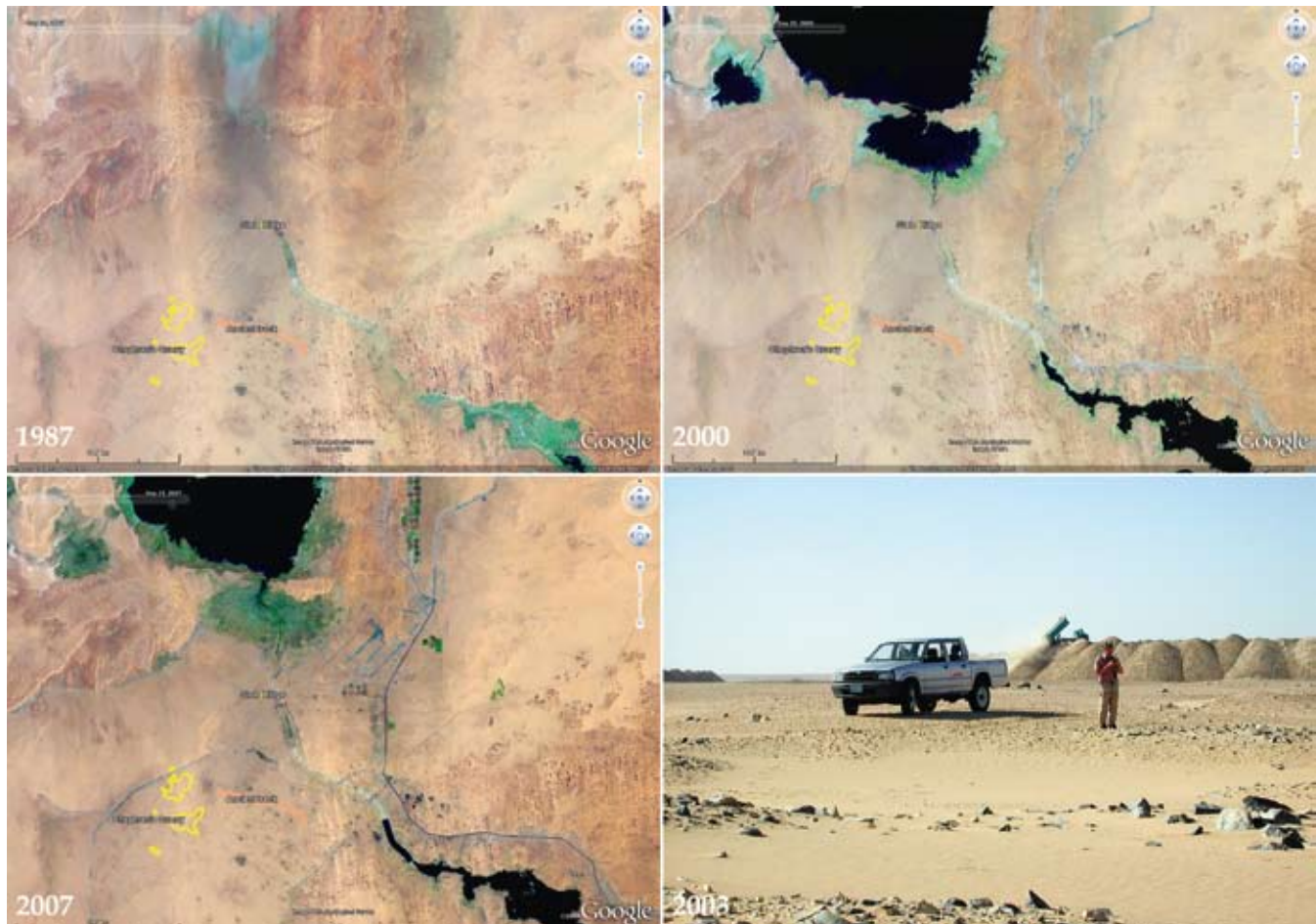


Figure 10. Development of the Toshka project area from 1987 to 2007. Compare with Figure 7. The photo shows the recording of ancient quarry workings near canal 4 in 2003. Satellite images: Google Earth. Photo: Per Storemyr.

300,000 and 500,000 people living here. Depending on counting procedures, this is a growth rate that is up to three times higher, or more, than the Egyptian average for the same period.

The old granite quarries between Aswan and Shellal were the first to be affected by the modern development. The Old Dam was built from enormous amounts of locally quarried granite, an undertaking that sparked off a bustling modern stone industry in the heart of the old quarries. Now, a hundred years later, there are dozens of companies operating here, producing for the domestic and international markets; and although ancient remains still exist (such as the Unfinished Obelisk), the context and integrity of the ancient landscape is entirely gone. This is also a result of massive urban expansion, which partially takes place within the ancient quarry areas because there is little available space elsewhere.

Expansion now touches the other ancient east bank quarries, in silicified sandstone, stretching 12–13 km from Aswan to Wadi Abu Aggag and Wadi Abu Subeira in the north. In the early years of the new industrial era after the 1952 revolution, this area north of Aswan City saw large-scale iron-ore mining for the steel plant at Helwan. However, iron-ore production ceased already by the 1970s when the higher-grade mines in Bahariya took over. Presently it is the massive clay mining for the Egyptian ceramic industry that dominates the hills and wadis in the area and destroys ancient quarries and other archaeological remains. The mouth of Wadi Abu Subeira is, furthermore, a place for large-scale modern sandstone quarrying, which has completely eradicated the ancient Gebel el-Hammam quarries. Ironically, the best preserved ancient quarries on a plateau north of Wadi Abu Aggag, where ornamental stone was procured in ancient times, are within a military area where development is banned (except, of course, for the military's own activities).

About 10% of the people in the Aswan area live in the extensive Nubian

villages on the west bank (Figure 15). Except for the gradual expansion of these villages, some road building and mainly small-scale artisan quarrying of sandstone for housing, this serene area with golden sand dunes was, in stark contrast to the east bank, until recently largely untouched by modern development. Consequently, the widespread, ancient silicified sandstone quarries and other archaeological remains had hardly changed their character for hundreds, even thousands of years. However, behind this picturesque scene power lines from the dams and new roads had literally cut off the area from the rest of the Western Desert already by the 1960s. And, alas, other developments are under way. Originally planned in the late 1970s, 1999 marked the start of the construction of New Aswan City, one of the so-called third generation, national urban development schemes, designed to be the home for 70,000 people. Following the now ongoing building of the city, a new bridge, inaugurated in 2002, has also been built across the Nile. This bridge not only serves the new city, but is a major link in the expanding road network in Upper Egypt, especially as regards transportation needs for the Toshka project. As for other large construction programmes, the building of the new city proceeds comparatively slowly and people have yet hardly begun to move in.

Conservation in Aswan

Notwithstanding the current pace of construction, it is likely that New Aswan City marks the beginning of the end of the west bank as a rather quiet zone in terms of modern expansion. There will be further needs for housing and development, and this now easily accessible desert flank of the valley offers valuable space. If archaeological remains are to be protected and managed, they thus have to be included in the overall land-use planning. Although compulsory in the realms of the Antiquities Law, as the construction of the new city began the

local cultural heritage was given no consideration whatsoever. After intervention in 2005–2006 by the local SCA office, called for and supported by the Quarry-Scapes project and other missions working in the area, it thus came as a surprise that the Governorate and the New Urban Communities Authority (a part of the Ministry of Housing, Utilities and Urban Development) seemed to welcome conservation of the main archaeological sites, a task that has implied serious replanning of land use. There may be many reasons behind this positive attitude, but a key issue is that the planners formerly simply did not know that the area itself and its neighbourhoods are full of archaeology. This failure of the local heritage authorities to properly inform and take action before it is too late is at the bottom line of conservation in Egypt. And one explanation is that the poorer-known, non-monumental sites of obscure significance are often unknown to the authorities themselves.

Clearly, it is now only possible to save isolated islets of archaeological remains, including ancient quarries, in the construction zone of New Aswan City. On other parts of the west bank there are considerably better opportunities to protect, manage and present archaeology within its landscape context through the participation of the local Nubian people, who for a long time have operated a small desert tourist 'industry' in the area, a welcome source of income. These environs, across the Nile from renowned Elephantine, are the only ones left along the valley in the Aswan area that have not yet become the focus of heavy modern development (Figure 16). There is a chance, indeed, for preservation to take place here, not only as seen from the positive attitudes in the New Aswan City case, but also in relation to other activities that may, hopefully, be the start of a greater focus on conservation in the region.

First, jointly with the SCA, the Swiss archaeological mission has for about 10 years undertaken rescue excavations in Aswan, by Egyptian standards a very special and successful archaeological



Figure 11. The Unfinished Obelisk quarry in Aswan from 1851 to 2008. Until Engelbach's excavation in 1922 hardly anything had happened at the site since antiquity, and even until the late 1960s the area around the quarry was little used (compare with Figure 10). Over the last decades modern Aswan has closed in on the quarry, and large-scale archaeological excavation and museum development has also taken place over the last several years. The lower picture shows the current situation: a quarry and museum 'island' in the midst of modern Aswan. The quarry is in the middle of the picture, whereas the area in front is the Islamic Fatimid cemetery. Photos: 1851—Félix Teynard (Library of Congress' Prints & Photographs Online Catalog, <http://hdl.loc.gov/loc/pnp/cph.3c27936>); 1900–1920—American Colony in Jerusalem, Dept. photographer (Library of Congress' Prints & Photographs Online Catalog, <http://hdl.loc.gov/loc/pnp/matpc.01591>); 1922–1923—from R. Engelbach *The Problem of the Obelisks*, T.F. Unwin, London, 1923; 1989—James A. Harrell; 2005 and 2008—Per Storemyr.

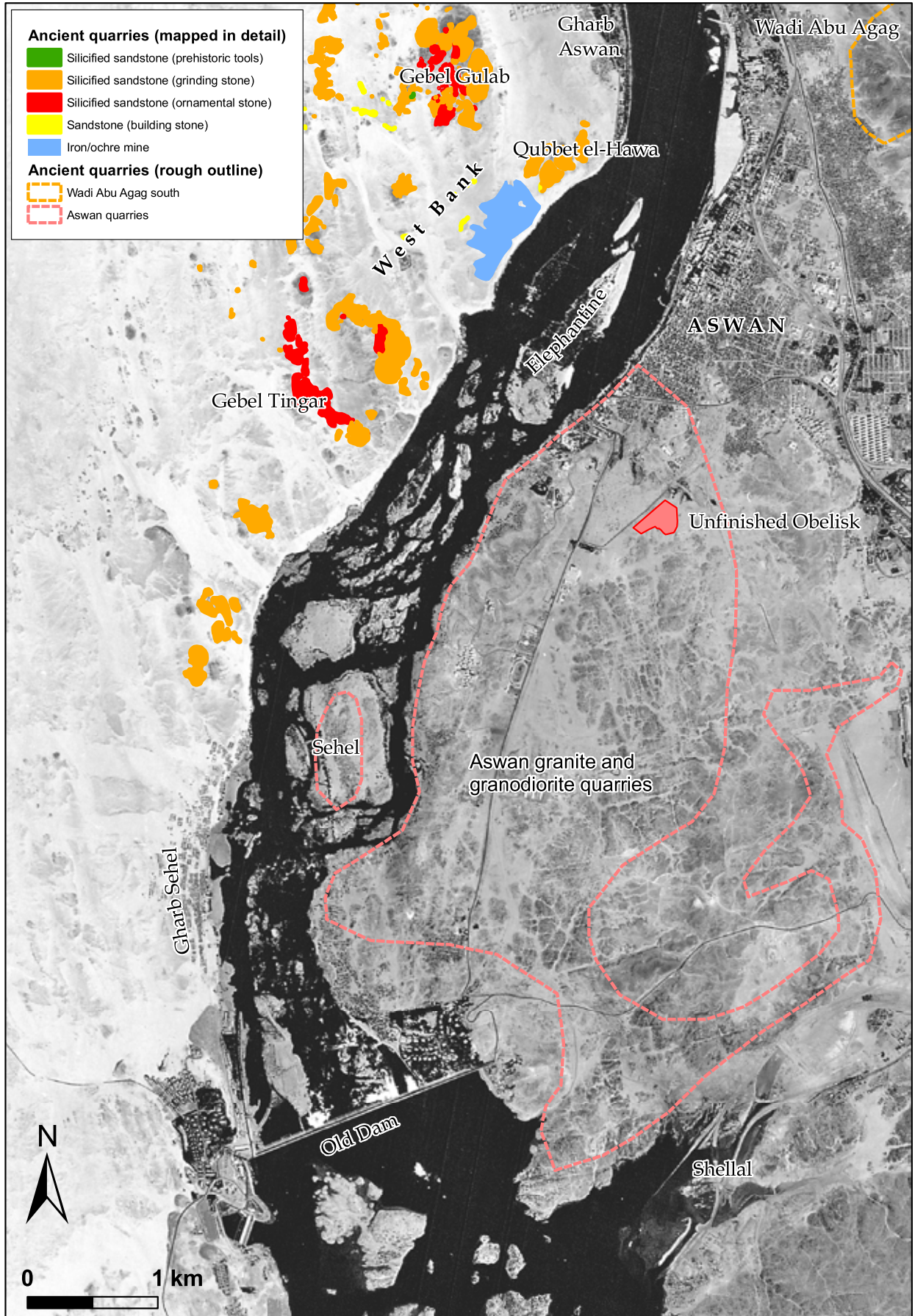


Figure 12. The first Nile cataract area and Aswan in 1965 with ancient quarry areas on the east and west banks, and the now-protected area of the Unfinished Obelisk quarry and museum. Map: the QuarryScapes project/Per Storemyr. Background satellite image: US declassified (Corona/KH7).

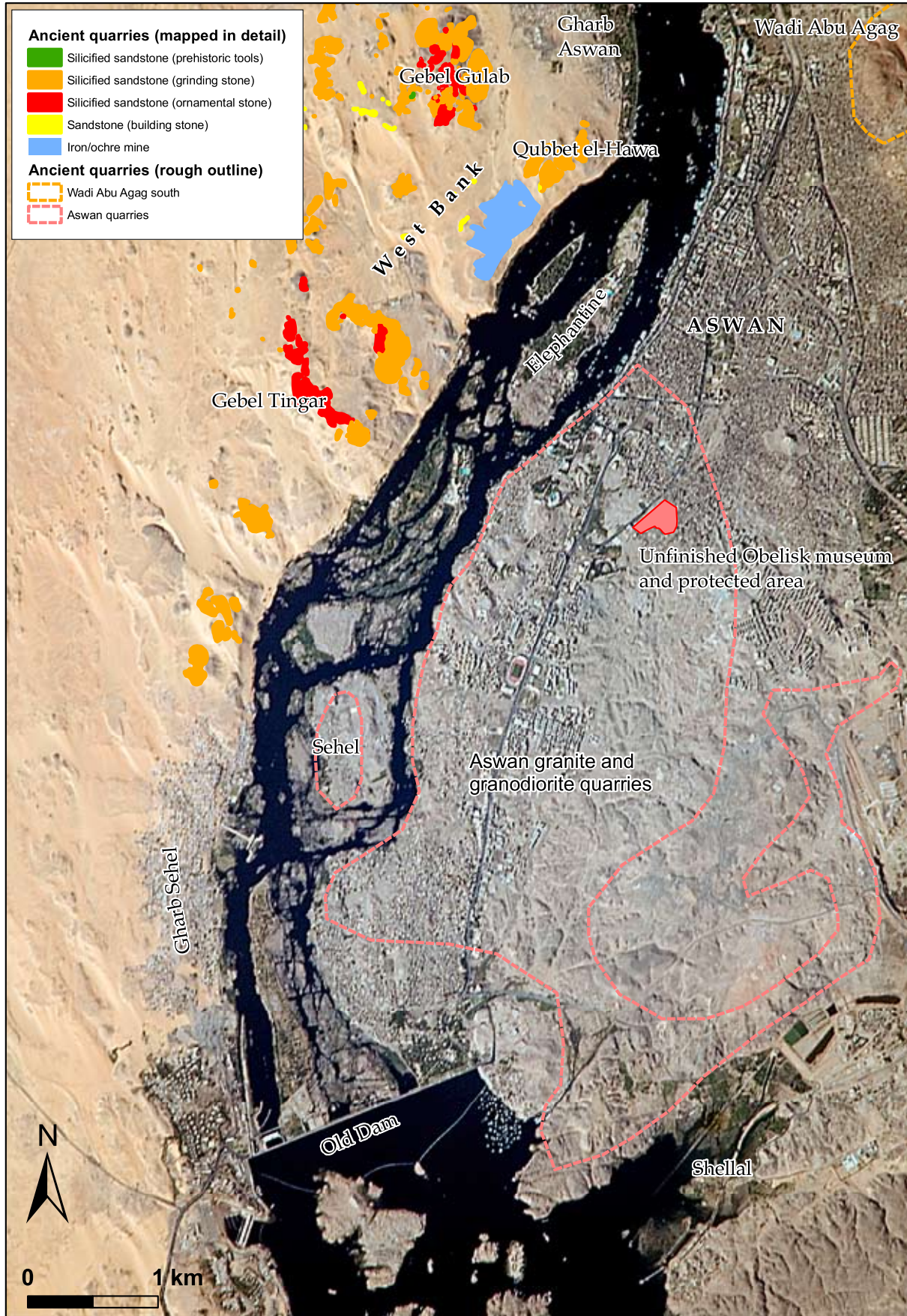


Figure 13. The first Nile cataract area and Aswan in 2008 with ancient quarry areas on the east and west banks, and the protected area of the Unfinished Obelisk quarry and museum. Compare with Figure 10. Map: the QuarryScapes project/Per Storemyr. Background satellite image: Astronaut photography (Image Science and Analysis Laboratory, NASA-Johnson Space Center. "The Gateway to Astronaut Photography of Earth." <http://eol.jsc.nasa.gov/scripts/sseop/photo.pl?mission=ISS017&roll=E&frame=20971>).



Figure 14. An unfinished Roman granite bathtub among modern quarry waste in the southeastern part of the Aswan granite quarries (close to the Kima fertiliser factory). Photo: Per Storemyr 2005.

programme that has brought to light the early history of the city. Second, centred on the Unfinished Obelisk quarry museum, and backed by the central SCA Cairo office, a few dedicated inspectors have created a milieu for recording and protecting ancient quarry remains in the urban and industrial jungle on the east bank (in particular within the ancient granite quarries). What makes this project unique is the direct and friendly cooperation with local quarrying and mining companies, which, like the developers in New Aswan City, have minimal knowledge of the ancient quarries they are blasting away. The companies are encouraged to join archaeological investigations in the areas where they are active and are given options in terms of other suitable deposits if it is decided that they must stop exploitation at the original place. Furthermore, in cooperation with governorate authorities, the companies are offered long-term quarrying licences

at the new places since one of the greatest problems in the Egyptian quarrying sector is haphazard planning due to the frequent issuing of short-term licences. Not without backlashes, this bottom-up programme has been able to protect a great deal of important archaeology in an area that is extremely high pressure in terms of demand.

The future

Current and future conservation of ancient Egyptian quarries (and other heritage resources) are, in many ways, faced with the effects of large-scale development schemes of national importance, originally planned decades ago with minimal reference to archaeology. As the case studies have demonstrated, the Toshka project and the building of new cities are two important examples. But also modern quarrying can at places

be viewed similarly, for example in the Northern Faiyum where the basalt deposits are regarded a national strategic resource with exploitation pursued from the 1960s onward. At other places, modern development may have been planned in a less centralised manner or, in many cases, is simply haphazard, but still it is often undertaken in the wake of grand schemes, again with negligible reference to poorer-known archaeological sites. Aswan, with its modern stone and clay industries, as well as its urban encroachment following the building of the dams, is a particularly vivid example of this kind of development. And the total destruction of Gebel el-Ahmar (and other ancient quarries) in Cairo, goes back to the urban development plans laid down in the 1950s and 1960s.

In addition to such large-scale, 'age-old' projects with a negative influence on ancient quarries, there are dozens of less extreme cases of more recently planned

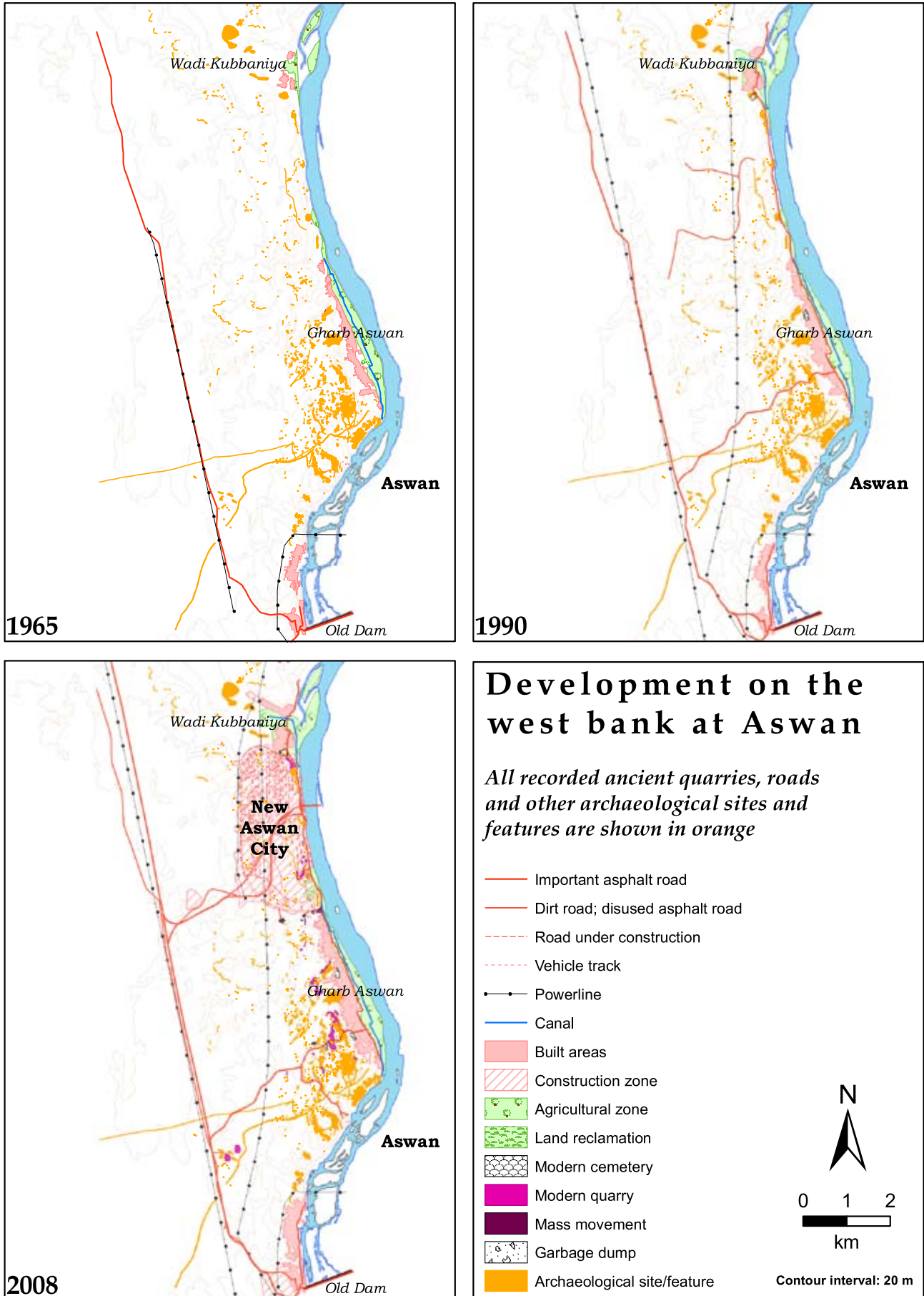


Figure 15. Development on the west bank of the Nile at Aswan between 1965 and 2008. Compare with Figures 10 and 11. Maps: the QuarryScapes project/Per Storemyr.



Figure 16. The 'industrial' Aswan east bank as seen towards the still well-preserved west bank with its sand dunes. Both places feature ancient quarries. Photo: Per Storemyr 2007.

or expected developments across the country. For example, modern quarrying in the Eastern Desert and along the flanks of the Nile Valley is already a key issue expected to become increasingly problematic in the future. This is because of the generally rapid and, in terms of long-term planning, haphazard expansion of these industries.

Without urgent protection measures and (re)planning that considers archaeological resources, all indicators point to continued heavy loss of heritage values and, at several places, the almost total disappearance of ancient quarries in the not-too-distant future. The recent attempts at saving bits and pieces, as reported here for the case study areas, are undoubtedly just a drop in the ocean in view of the challenges ahead. It is thus extremely welcome that the heritage authorities have recognised the need for more concerted actions and, as a result of the activities around the Unfinished Obelisk in Aswan, in 2006 decided to

establish a special SCA department for conservation of ancient quarries (and ancient mines) throughout Egypt. A main intent of this small department is to undertake education and training for regional SCA offices, enabling their inspectors to recognise and protect this group of archaeological remains. The new department is in no way exempt from the endemic lack of resources, yet it has been able to carry out field-training courses and make plans for the development of an 'ancient stone centre' on the precincts of the Unfinished Obelisk quarry.

In such a department there is hope for the future. Nonetheless, any kind of favourable, long-term institutional development is dependent not only on dedicated individuals, but also on national and international support—and perhaps on the general political course troubled Egypt may take in the future. Given that the department will become more than a transient phenomenon, it will have to work in several arenas simultaneously.

First, in high-pressure areas (like Aswan) it simply has to survey, excavate, document and save as much as practically viable. Second, in a longer-term perspective it has to pursue the nation-wide inventory (mentioned above), which also needs to address the relative significance of the ancient quarries. Third, since it is not possible to save everything, selected quarries must be targeted for conservation on different levels, sometimes in alliance with other bodies, for example with environmental authorities responsible for nature protectorates within which several ancient quarries are located. Some quarries are important, even unique, in a global context while others may hold significance on a regional (e.g., Eastern Mediterranean) level, whereas many must be regarded as of primarily national, provincial and local value. The latter group is probably the largest, encompassing many of the 140 limestone and sandstone quarries along the Nile; thus a special challenge is to select representative candidates for con-

servation. For the quarries of global significance there can be no doubt that they all in one way or another should be saved for the future (for example most of those mentioned in the case studies above).

The making of such survival 'lists' is, of course, not straightforward because it is profoundly dependent on methods for assessing significance, whether from an archaeological, a contemporary socio-cultural or economic perspective. Moreover, the condition of the quarries, or their integrity, as expressed in the 'Operational Guidelines for the Implementation of the World Heritage Convention', will heavily influence assessment. When a quarry and its context are largely destroyed, all one can do, regardless of past importance, is to document the sad remains and leave the place to the bulldozers. Like Gebel el-Ahmar such a site is gone and only interesting for the devoted quarry researcher.

To avoid too many similar destinies, the perhaps most important task is to promote ancient quarries, gaining public attention and securing that well-managed samples will be accessible as showcases for local residents (and developers), Egyptian visitors and foreign tourists. If nobody is interested in these places or understands their 'basics', there can be few incentives for carrying out all the work needed to safeguard them. Getting public attention is certainly not an easy task when competing with pyramids, temples and mummies in a country where most people are suffering badly from political, economic and social problems. The recently established quarry conservation department will need all the help it can get—from local people that may identify with 'their' quarry and take part in its management and presentation, to international institutions that may see the significance of the quarries in a world heritage perspective and grant the resources needed.

Sources and acknowledgements

Information about the case studies and

the general condition of ancient Egyptian quarries can be found in a comprehensive QuarryScapes report by Storemyr et al. (2007), which includes primary references. Additional relevant material for the Aswan case is available in Bloxam et al. (2007) and methods for assessing significance are discussed in Bloxam and Heldal (2008) and Bloxam (2009). A general overview of ancient Egyptian quarries is presented by Harrell and Storemyr (2009). See Shawarby et al. (2009) who discuss research activities undertaken by The Egyptian Antiquities Information System (EAIS) now the GIS Center of Excellence within the Supreme Council of Antiquities (SCA) concerning the digital documentation of the Egyptian Quarry Landscapes undertaken during QuarryScapes. For a sober account on overall development trends in Egypt, including important data relevant to all the case studies, see Ibrahim and Ibrahim (2006). Fagan (2004) gives an accessible history of the fate of the Egyptian heritage at large, from antiquity to the present, see also Jeffreys (2003) and Wilkinson (2008) on related subjects. The brief description of the modern heritage sector and SCA is based on my own experience and conversations with inspectors and archaeologists over the years as well as media reports (e.g., in *Al-Ahram Weekly*). *The Valley of the Kings Site Management Masterplan* (Weeks et al. 2006) provides a very useful reference to cultural resource management in Egypt and also includes a comprehensive bibliography relevant to this essay.

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