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The industrial landscape of the Northern Faiyum Desert as a World Heritage Site: modelling the 'outstanding universal value' of third millennium BC stone quarrying in Egypt

Elizabeth Bloxam and Tom Haldal

Abstract

The pyramids and temples of the Egyptian Old Kingdom (early-mid-third millennium BC) are testament to an epoch of global significance in the evolution of monumental stone architecture. The basalt quarries of Widan el-Faras and gypsum quarries of Umm es-Sawan, located in the Northern Faiyum Desert of Egypt, were key production sites in the foreground of this transformation to large-scale stone quarrying. Yet, the significance and value of these archaeological sites in shaping elements of the cultural landscape of the Northern Faiyum Desert, currently under nomination for World Heritage listing, remains largely in the background. This paper attempts to develop a methodology to articulate 'outstanding universal value' and to raise the significance of the largely mundane and non-monumental remains of these production sites. By deploying formulations in landscape archaeologies and key concepts used in the nomination of the Blaenavon industrial landscape in South Wales as a World Heritage Site, it argues for the cultural landscape of the Northern Faiyum Desert authenticating one of the world's oldest 'industrial' landscapes related to large-scale stone quarrying.

Keywords

Quarries; Old Kingdom; basalt; industrial landscape; Northern Faiyum; Egypt.

Introduction

The cultural heritage of pharaonic Egypt is synonymous with its monumental buildings, such as the pyramids along the Giza Plateau to Dahshur, temples at Luxor, Abu Simbel

and Philae, which, as outstanding constructional achievements, are all World Heritage Sites (Jokilehto 2005: 126). Yet, this monumentality was the product of a 'revolution' in large-scale stone quarrying and transport, commencing in the third millennium BC, the global significance of which has largely gone unrecognized. The ancient quarries from which the raw materials for these and other constructions were obtained are the 'forgotten' archaeological sites in Egypt, the majority of which are unregistered and unprotected as cultural heritage sites. The basalt quarries of Widan el-Faras and gypsum quarries of Umm es-Sawan, located 70km south west of Cairo in the Northern Faiyum Desert, are no exception (Fig. 1). As key archaeological sites in the foreground of the early phases of this stone-quarrying phenomenon, between the early and mid-third millennium BC, they are largely unknown. Recent extension of the



Figure 1 Map of Egypt showing ancient quarries mentioned in the text.

boundaries of the Lake Qarun Protectorate means that Widan el-Faras and Umm es-Sawan are now included in a current nomination, under preparation by UNESCO Egypt MAB (Man and the Biosphere) Committee, for designation as a mixed natural/cultural World Heritage Site (Fig. 2). Yet, the significance and value of quarrying at Widan el-Faras and Umm es-Sawan in shaping the cultural landscape of the Northern Faiyum remain largely in the background of the nomination. Rather, the main emphasis for inclusion lies on the significance of the Protectorate's fossil record, as an extension of the Wadi Hitan (Whale Valley) natural landscape inscribed as a World Heritage Site in 2005 (WH no. 1186).

If ancient quarries in general are to be recognized and protected as important archaeological sites, this is contingent on how their significance and values are disseminated at local, national and international levels. With 'outstanding universal value' being the baseline criterion for World Heritage listing (UNESCO 1972), there is clearly a need to develop a methodology to articulate the values of the non-monumental and mundane archaeological remains of ancient quarries in these terms. By deploying some recent formulations in landscape archaeologies, together with key concepts used in the nomination of the Blaenavon industrial landscape in South Wales (UK) as a World Heritage Site in 2000 (WH no. 984), the objective is to illustrate the significance of Widan el-Faras and Umm es-Sawan in authenticating the cultural landscape of the Northern Faiyum as representing one of the world's oldest 'industrial' landscapes related to large-scale stone quarrying.

Conceptualizing the 'outstanding universal value' of industrial landscapes

The inclusion of 'cultural landscapes' as a category for World Heritage listing since 1992, as entities that demonstrate 'combined works of nature and man' of universal value, has been a key advance for the recognition and conservation of such places (Platcher and Rössler 1995: 16; Titchen 1996: 238–9). Moreover, recognizing the existence of the nature-culture continuum as a criterion for inscription on the World Heritage List (von Droste 1995: 21; Cleere 1996: 231; Titchen 1996: 239) provides the opportunity to raise the profile of and include 'industrial landscapes' as potential sites for inclusion. As Platcher and Rössler (1995: 17) point out, drawing comparisons, designing concepts and methodologies to conceptualize the value of cultural landscapes can provide baselines for their identification and assessment globally.

With only sixteen industrial landscapes, all linked to mining, listed as World Heritage Sites (Jokilehto 2005: 78), and only five in a non-European context, the ancient quarry landscape of the Northern Faiyum presents an enormous challenge in how it can be modelled, not only within the key criterion of 'outstanding universal value' but as a quarry landscape in a non-Western context. The concept of 'outstanding universal value' and authenticity as key criteria for inscription of natural and cultural landscapes on the World Heritage List has provoked some controversy (Cleere 1996: 227–33; Titchen 1996: 235–42): for instance, on how 'universal' value can actually be attributed to cultural landscapes situated across a range of diverse geographical locations, cultural traditions and concepts of authenticity that encompass a broad range of definitions not just focused on the

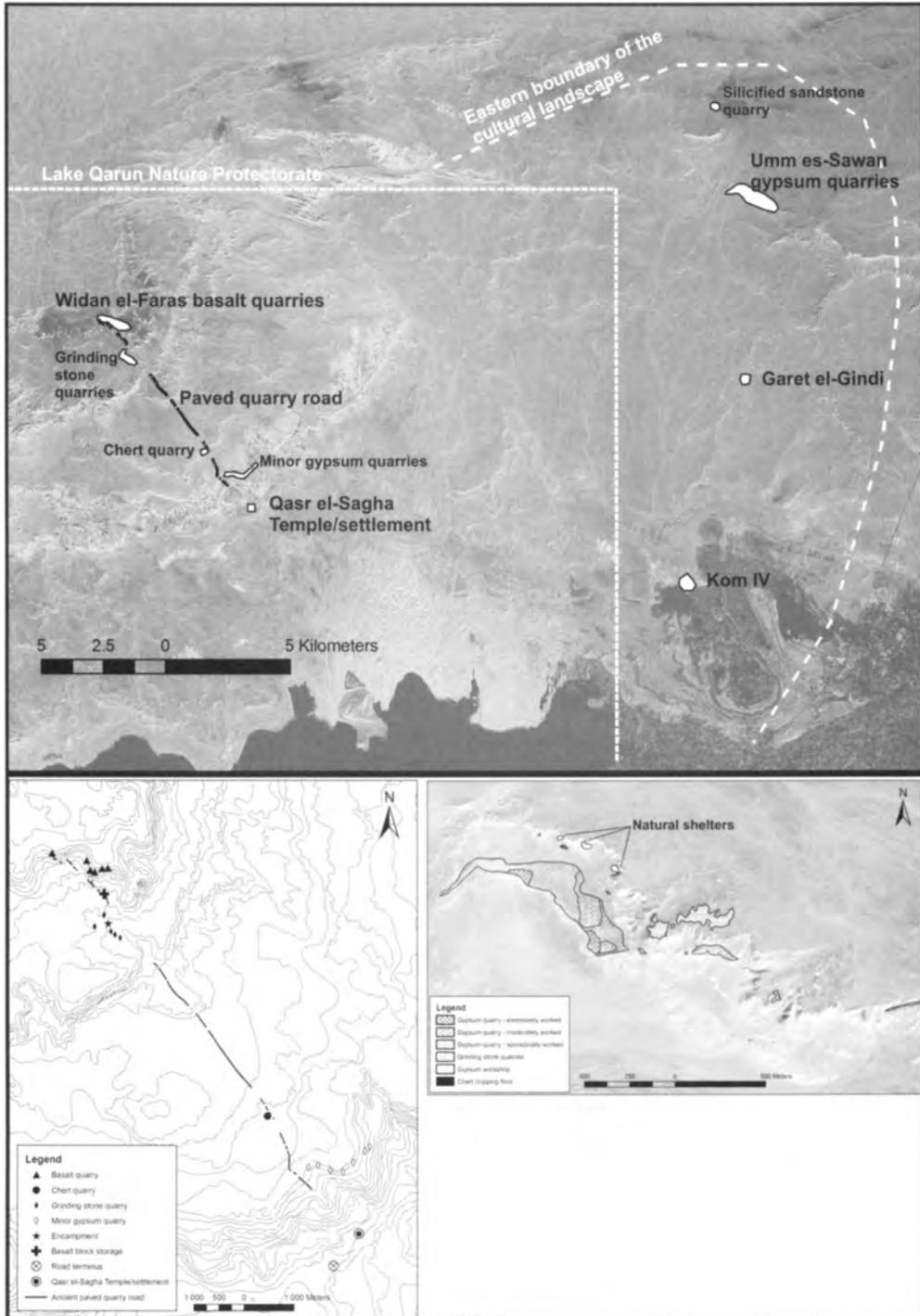


Figure 2 Map of the Northern Faiyum Desert (above) showing part of the current border of the Lake Qarun Protectorate and extended border to include all elements of the industrial landscape (total 600km²). Below left, detailed map of the main elements of the Widan el-Faras basalt quarries; below right, detailed map of the main elements of the Umm es-Sawan gypsum quarries.

monumental (von Droste 1995: 22–3; Cleere 1996: 228–9; Titchen 1996: 236–7). Moreover, is the importance of evaluating ‘universal value’ in more abstract terms such as a theme or innovation that historically has global significance (see Fowler 2003: 56–8, 2004: 130–1).

The Nara Conference on authenticity (UNESCO 1994) introduced a more open and flexible approach to the cross-cultural problems in determining authenticity, which in the context of cultural landscapes means their distinctive character and components (von Droste 1995: 22–3; Mitchell 1995: 245; McBryde 1997; Fowler 2004: 5). A concept of authenticity that considers multi-layered impacts on the landscape as significant is important, particularly in ancient industrial landscapes that have evolved over several thousand millennia. The social construction of the landscape thus becomes a crucial component in conceptualizing the significance of the transformed landscape across time, an issue that has recently produced a range of theoretical approaches in landscape archaeologies (see Ingold 1993; Ucko and Layton 1999; Ashmore and Knapp 1999; Barrett 1999; Thomas 2001).

Contributions from landscape archaeologies are important for conceptualizing the authenticity of multi-layered cultural landscapes, which by their very nature are fragmented, with multiple meanings across time (Ingold 1993: 152–3, 171–2; Barrett 1999; Knapp 1999; Thomas 2001: 166, 181). In the context of stone quarries, certain sources may be places in the landscape that hold a specific resonance across many generations of kin. As Edmonds (1999: 47–8) points out, these places may be key to maintaining social relations through stone working traditions, as well as confirming ties with past generations who exploited the resource. Moreover, that the raw materials themselves have histories connected to identities and place is important in bringing out the nature-culture continuum, not only between stone sources and places of artefact deposition, but between people and places (Barrett 1999: 27; Cooney 1999: 51–6, 59–61; Bradley 2000: 81–6). For instance, non-local exotic stones used as tools in production sites can be key to understanding not only extended social networks linked to kin-groups engaged in quarrying, but the importance of specific stone sources (Bradley and Edmonds 1993: 96; Cooney 1998: 108–18, 1999: 49–51; Bradley 2000: 86–7; Boivin 2004: 10–16).

Recognition of Blaenavon in South Wales, an industrial landscape of the recent past, as a World Heritage cultural landscape in 2000 provides some key concepts in how to articulate the ‘outstanding universal value’ of a landscape transformed by raw material procurement in the eighteenth and nineteenth centuries. Characterized by production waste and mundane elements, the cultural landscape was put forward as representing ‘a combined work of nature and man . . . one of the best examples in the world of a landscape created by coal mining and iron-making in the late eighteenth century and early nineteenth century’ (Torfaen County Borough Council 1999: 7). Important to the nomination document that led to inscription of the Blaenavon industrial landscape was how mundane features, within a transformed landscape, were articulated as having ‘outstanding universal value’. The components that make up the distinctive character of the Blaenavon industrial landscape were shown to have been shaped by large-scale raw material exploitation linked to the Industrial Revolution, which created an arena of the ‘human experience of industrialization’. The human dimension and social implications are foregrounded as demonstrating the ‘co-existence within it of heroic and mundane

structures as the *setting* for profound developments in human cultural values' (Torfaen County Borough Council 1999: 16, 19). The global significance of Blaenavon is made broadly accessible by claiming some 'world firsts' in technological innovation linked especially to transport infrastructure and as the first producer of 'mild steel' (Torfaen County Borough Council 1999: 8; also see Fowler 2004: 102).

An overview of the natural and cultural landscape of the Northern Faiyum Desert

Bounded to the south by Lake Qarun and to the north by the escarpment of Gebel Qatrani, the natural and cultural landscape of the Northern Faiyum Desert (within the Lake Qarun Protectorate) comprises an area of approximately 600km² of largely hyper-arid desert (Fig. 2). The natural environment includes Eocene and Oligocene fossil sites of global significance as they constitute an almost complete record of vertebrate evolution in Africa (Bown and Kraus 1988; Simons and Rasmussen 1990; Dolson et al. 2002). The fossil rhizoliths there are some of the best preserved in the world, and, along with major forests of petrified wood, constitute a unique evolutionary record of climate, plant and animal life.

The cultural landscape represents a multi-layered history of human activity linked to utilization of the waters of ancient Lake Moeris (modern Lake Qarun) and exploitation of the surrounding natural resources, such as chert, gypsum, basalt, silicified sandstone and fossilized wood. Since the earliest known archaeological remains, a series of Neolithic (fifth millennium BC) settlements along the ancient lake's extinct shorelines, there was almost continuous occupation in the area into the fourth century AD Coptic period (Caton-Thompson and Gardner 1934). Monumental structures characterize the later phases of activity, such as the Middle Kingdom temple and settlement at Qasr el-Sagha and those of the Graeco-Roman period at Dimai and Karanis (Caton-Thompson and Garner 1934; Arnold and Arnold 1979; Gazda 1983; Kozłowski 1983). Despite the continuous occupation of this landscape, the authenticity and integrity of these archaeological sites has been maintained largely due to natural fluctuations in the level of the lake necessitating periodic settlement movements (Caton-Thompson and Garner 1934: 89; Ball 1939; Wendorf and Schild 1976; Wenke and Lane 1983: 25; Hassan 1986; Brewer 1989: 129-30; Kozłowski and Ginter 1993; Wetterstrom 1993: 204). Hence, with little later disturbance, these constitute rare evidence of ancient settlements in Egypt.

With the focus of archaeological research largely invested in those material remains situated along the extinct shoreline of Lake Moeris, the hinterland, comprising three rising escarpments terminating at the Gebel Qatrani escarpment, has been of less interest to researchers. The quarries and associated infrastructure of Widan el-Faras and Umm es-Sawan that make up the material remains of the industrial landscape of the Northern Faiyum (Fig. 2) have remained largely intact and little investigated since the work of Caton-Thompson and Gardner (1934) in the 1920s. Both sites were ignored for almost seventy years until the geological investigations at Widan el-Faras by Harrell and Bown (1995) in the 1990s and that of the authors since 2001 (Bloxam and Storemyr 2002; Bloxam 2003, 2007; Haldal et al. in press; Bloxam et al. in press). Current work has

undertaken detailed documentation and survey of the archaeological and geological landscape, with the aim of visualizing the industrial components of the Northern Faiyum Desert.

Visualizing the authenticity and significance of mundane production sites

The existence of ancient basalt quarries within the Gebel Qatrani escarpment had been known for a century (Beadnell 1905), although the actual extraction sites along the rim (350m above sea level) behind the two highly visible peaks of Widan el-Faras (translated as ‘horse’s ears’) were not recognized until the work of Harrell and Bown (1995) in the mid-1990s (Plate 1). The basalt occurs as an 8–15-metre thick layer of Oligocene basalt flows which cap the sedimentary rocks of the Gebel Qatrani escarpment that extends east to Abu Roash, close to the pyramid fields (Simons and Rasmussen 1990: 627; Heikal et al. 1983; Klemm and Klemm 1993: 413–15; Harrell and Bown 1995: 76).

Faiyum basalt has a long history of consumption that ebbed and flowed from at least the Faiyum Neolithic (fifth millennium BC), when it was used for axes (Lucas 1930: 203–5; Caton-Thompson and Gardner 1934: 25–6), into the Roman period when it was used for small statuettes (Harrell and Bown 1995: 73; Empereur 2000: 11; Bloxam and Storemyr 2002: 28). The consumption record suggests that almost continuous exploitation of basalt occurred between the fifth and third millennia BC. By the Predynastic period (fourth millennium BC Naqada I) basalt had become an important material used in an emerging stone vessel industry (Lucas 1930: 205; Debono and Mortensen 1988; Aston 1994;



Plate 1 Widan el-Faras basalt quarries: foreground, one main extraction; background, the peaks of Widan el-Faras.

Mallory-Greenough et al. 2000: 326; Wengrow 2006: 34). Yet the zenith of basalt consumption, and concomitantly the greatest impact of quarrying along the Gebel Qatrani escarpment, is that dating to the early to mid-third millennium BC when it was used for monumental constructions (Hoffmeier 1993; Harrell and Bown 1995: 74–5; Mallory-Greenough et al. 2000: 326). The quarries, visualized as a series of shallow bench-like depressions in the deposit, were authenticated as the source of the basalt used mainly for floors and walls in the Old Kingdom (fourth and fifth Dynasty) mortuary temples of king's Khufu, Userkaf, Sahure and Nyusera (Harrell and Bown 1995: 74–5; Mallory-Greenough et al. 2000). Ceramic evidence in the quarries also confirmed that the main extractions dated to exploitation between the fourth and fifth Dynasties of the Old Kingdom (Bloxam and Storemyr 2002: 26). Although modern quarrying since 2002 has impacted to some extent on these quarries, almost obliterating some later Roman period quarrying, the integrity of the Old Kingdom quarries as significant archaeological monuments still remains.

The gypsum deposits of Umm es-Sawan occur as low-lying terraces within the upper part of the Eocene Qasr el Sagha Formation (Dir Abu Lifa Member; Bown and Kraus 1988: 37), 25km north-east of Widan el-Faras. Characterized by a series of shallow sand-filled sub-surface extractions, the quarry landscape can be visualized more by the secondary workings, which form a series of workshop mounds situated 200m above the quarries. Even though there is evidence of some later working in the Roman period, the authenticity of these workings attests (from dating ceramic evidence across the site) to the transformed landscape being largely characterized by Old Kingdom quarrying between the third and fourth Dynasties (Caton-Thompson and Gardner 1934: 110–13; El Senussi 2006) (Plate 2).

Procurement strategies, such as which parts of the deposit were targeted and how the stone was extracted, may be significant in articulating connections, over several generations, between specific sources and those who inhabited the landscape. Why basalt was specifically sought after from Widan el-Faras for monumental construction projects, when the eastern extremity of the flow extended much closer to the pyramid fields at Abu Roash, is significant to such questions. Although it could be argued that Widan el-Faras basalt was particularly sought after due to better quality, this is difficult to attest comparatively because the eastern extremity of the flow is now destroyed. From a purely resource perspective, however, the evidence presented at Widan el-Faras can only suggest that areas of the deposit here may have been selected due to the probability of obtaining sufficiently large blocks for the construction of the pyramid floors (Bloxam and Storemyr 2002: 26). But, as several commentators have pointed out (Cooney 1998, 1999; Bradley 2000; also see Boivin 2004), the complexity surrounding the selection of some stone sources over others may not necessarily imply that quality was always a key factor.

The importance of source over stone quality is similarly difficult to attest in relation to gypsum quarrying at Umm es-Sawan, particularly as there are several gypsum terraces in the area where traces of quarrying are yet to be fully investigated. Yet, it appears that Umm es-Sawan was where the main gypsum production was concentrated in the early to mid-third millennium BC and where there seem to have been the richest deposits (Plate 3).

Local deposits of fossilized wood, chert, sandstone and silicified sandstone are all known to have been exploited since the Neolithic (Caton-Thompson and Gardner 1934:



Plate 2 Workshop mounds at Umm es-Sawan: foreground, clusters of vessel blanks or rough-outs; background, workshop debris above which is a natural rock shelter in the overhang.



Plate 3 Umm es-Sawan gypsum quarries: foreground, the extractions; background, escarpment with one of the workshops shown as white area top left.

25–6). At Umm es-Sawan fossilized wood was a key local resource, minimally worked into rod-shaped pieces and found associated with stone hammers largely of chert. These materials occur in significant quantities in the quarries, suggesting their use as tools.

However, large concentrations of chert are not found in natural occurrences in the quarry area, and are assumed to have been brought to the place either from bedrock deposits in more distant parts of the Gebel Qatrani Formation or (more likely) from concentrated alluvial deposits of chert cobbles in the eastern part of the Faiyum. Other stone hammers from local and semi-local sources include a silicified gravel conglomerate, basalt (nearest source is approximately 4km away) and a characteristic silicified sandstone, which is believed to come from a quarry discovered during the 2006 survey, 4km to the north west.

Despite this use of some local and semi-local resources in the extraction process at Umm es-Sawan, the most significant features of the stone-tool assemblages are those made from non-local exotic stones, especially at Widan el-Faras where all the stone tools come from distant sources (Harrell 2002: 235). Significantly, some are from sources up to 800km away, such as the blue and visually distinctive Chephren Gneiss that has one source at Chephren's Quarry near Abu Simbel (Engelbach 1938; Harrell and Brown 1994; Storemyr et al. 2002) and granodiorite from the Aswan region. These stones are found shaped into tools, but also as small unworked blocks, and possible vessel 'blanks' or rough-outs. This evidence raises the significance of the Northern Faiyum industrial landscape to another level as constituting the highest concentrations of imported stones known in any ancient quarry in Egypt. The broader implications and significance of this material will be part of a later discussion.

Dating large-scale basalt production at Widan el-Faras to the Old Kingdom, as mentioned above, was possible from relatively good preservation of architectural elements made from the stone in the mortuary temples. With gypsum, this change to intensive production by the Old Kingdom is more difficult to ascertain given its consumption as mortar and fragile stone vessels (Caton-Thompson and Gardner 1934: 108–9; Aston 1994: 47–53). Yet, the production data at Umm es-Sawan, in particular those recorded by Caton-Thompson and Gardner (1934: 105), refer to over 3,000 vessel 'blanks' or rough-outs associated with the workshop mounds. Although considerably fewer are visible today, quantities of vessel blanks in forms particular to the Early Dynastic and Old Kingdom (Aston 1994: 47–53) can still be observed beside the workshop mounds (Plate 2). Thousands of crescent-shaped drills made of chert recorded by Caton-Thompson and Gardner (1934: 129–31) further attest to intensive production, perhaps finishing of vessels in the quarries. At Widan el-Faras there seems to have been a minimal amount of block working beyond rudimentary trimming to reduce the transport weight (Bloxam 2003: 186). However, at Khufu's mortuary temple there is evidence of cutting the basalt blocks with large saws, representing the world's first appearance of such technology applied on hard rocks (Petrie 1883: 174–5; Moores 1991).

Technological innovation as a consequence of large-scale stone procurement in creating the industrial landscape is most visually accessible in the construction of transport infrastructure. An engineering phenomenon of the third millennium BC, the 11km quarry road that links Widan el-Faras with Lake Moeris is one of the world's oldest purpose-built paved roads (see Harrell and Bown 1995: 79) (Plate 4). It represents a major achievement in road building using a range of locally available raw materials, such as fossilized wood, basalt, mudstone and sandstone (Harrell and Bown 1995: 78–83; Bloxam and Storemyr 2002: 29–31). In shaping the industrial landscape the road creates a uniform 2.1m corridor



Plate 4 Segment of the ancient quarry road leading from Widan el-Faras (background upper right) to Qasr el-Sagha; foreground segment comprises fossilised wood and silicified sandstone.

delineating the shortest route to water. The road terminates on an elevated promontory at the shoreline of ancient Lake Moeris, on which weathered remains of large basalt blocks form a sharp contrast of black dots against an otherwise yellow landscape (Wendorf and Schild 1976: 220; Arnold and Arnold 1979: 25; Harrell and Bown 1995: 86). A connection between high Nile floods during the fourth and fifth Dynasties (Hassan 1997; Said 1993: 134) coinciding with the peak in large-scale stone procurement points to Lake Moeris as the crucial interface in the stone transportation process (Shafei 1960: 192–3; Harrell and Bown 1995: 83; Bloxam and Storemyr 2002: 34–5). From Umm es-Sawan, according to observations made by Caton-Thompson and Gardner (1934: 103), a 20km ‘caravan’ route heads south west in the direction of the Old Kingdom settlement of Kom IV at Lake Moeris. Although traces of another ancient track were recorded (Petrie 1887; Caton-Thompson and Gardner 1934: 109–10), suggesting a link between Umm es-Sawan and the eastern Faiyum with Dahshur, dating of this road to either the Old Kingdom or Roman Period is uncertain.

The social construction of the industrial landscape

Purpose-built enclosed settlements with hierarchical elements, typically associated with Roman period quarrying at Mons Claudianus (Peacock and Maxfield 1997) and Mons Porphyrites (Maxfield and Peacock 2001) in the Eastern Desert, are not attested at either Widan el-Faras or Umm es-Sawan. Rather, a small ephemeral encampment at Widan el-Faras and utilization of some natural rock shelters at Umm es-Sawan characterize the dwellings in immediate proximity to the quarries. Along with small amounts of ceramics,

dating largely to the period of most intensive exploitation between the fourth and fifth Dynasties, these constitute the only visible remains of human settlement at the quarries (Caton-Thompson and Gardner 1934: 117–20; Bloxam and Storemyr 2002: 33–4; El Senussi 2006). Yet at Lake Moeris two contemporary Old Kingdom settlements, at Qasr el-Sagha and Kom IV, were described by Caton-Thompson and Gardner (1934: 97–8, 134) as being associated with stone-working.

Qasr el-Sagha and Kom IV lie directly south of Widan el-Faras and Umm es-Sawan respectively (Fig. 2). Connected to the quarries via their transport routes, these sites can also be linked by typological similarities between some ceramics, potters' marks and, more specifically, the distinctive fabric of locally made pottery (containing dark particles) attested at both Widan el-Faras and Umm es-Sawan (Caton-Thompson and Gardner 1934: 99–100, 110–16, pl. lxvi.30; Bloxam 2003: 267; El Senussi 2006). Non-local exotic stones are found across all these sites usually as tools. Notably, Chephren Gneiss was found at Kom IV in the form of partial and complete vessels (Caton-Thompson and Gardner 1934: 97–8). Although the present structural elements of the temple at Qasr el-Sagha date to the Middle Kingdom, whether these were placed on earlier Old Kingdom foundations remains unresolved (Caton-Thompson and Gardner 1934: 132; Arnold and Arnold 1979). In essence, the components that make up the industrial landscape of the Northern Faiyum extend from the hinterland quarries to these once lakeside settlements. Moreover, this connectedness can be visualized across the landscape via the natural landmarks of the Widan el-Faras peaks, the pyramidal hill of Garet el-Gindi and the Qasr el-Sagha escarpment, which all share significant inter-visibility.

Even with the advent of intensive resource exploitation in the Northern Faiyum, there is no evidence from either the lakeside settlements or the ephemeral camps at the quarries to suggest that significant social stratification occurred in the transformation to intensive production. Rather, the significance of the socially constructed landscape may be related to the sources themselves as key places which connected local kin groups with those who had worked the resource over many generations. Arguably, this was the socially cohesive force that maintained the 160-year longevity of exploitation of these resources, associated with the peaks of pyramid construction. Similar arguments were also raised in the context of Middle Kingdom (second millennium BC) gemstone mining in Egypt's marginal territories (Bloxam 2006).

Yet, these relationships were fluid. For instance, recently documented silicified sandstone quarries, in the nearby environs of both Widan el-Faras and Umm es-Sawan, attest to this largely Old Kingdom extraction activity being for utilitarian grinding stones (see Fig. 2). These quarries might indirectly suggest the necessary provisioning of objects, related to food processing, needed by an expanding resident population. The concentrations of exotic non-local stones across the industrial landscape are also significant in understanding the underlying social dynamics linked to intensive production. As pointed out by Bradley and Edmonds (1993: 96) and Cooney (1999: 49–51), these social transformations may have led to the extension of existing social networks linked to kin-groups engaged in quarrying. If such social transformations are placed in their historical context, then such changes may have been entangled within a backdrop of macro-level ideologies and power strategies related to monumentality and the quest for stone from

distant sources. Chephren's Quarry in Lower Nubia, the source of Chephren Gneiss, was witness to a simultaneous explosion in exploitation for life-sized royal statuary in the fourth Dynasty (Engelbach 1938; Harrell and Brown 1994; Shaw and Bloxam 1999; Storemyr et al. 2002). Hence, deposition of exotic blue Chephren Gneiss in the Northern Faiyum may be significant in formulating arguments that suggest links between these sites through extended social networks (Bloxam 2007: 26).

The authenticity of the relict industrial landscape of the Northern Faiyum, as a product of large-scale stone procurement set within the early to mid-third millennium BC, is due to its cessation by the end of the fifth Dynasty as attested from the ceramic evidence (Bloxam and Storemyr 2002: 26; El Senussi 2006). Moreover, the consumption record also corresponds to this cessation, with the fifth Dynasty mortuary temple of Nyuserra at Abu Sir constituting the last monument to have used basalt in any significant amounts (Bloxam and Storemyr 2002: 28). With large-scale transport being reliant on high Nile floods, which it is suggested were considerably lower by the end of Old Kingdom (Butzer 1984: 107; Said 1993: 134; Hassan 1997: 5–6; Stanley et al. 2003: 395–402), this may have severed the connection between Lake Moeris and the Nile. Consequently, the quarry road with its southerly direction to the lake became obsolete. Apart from such functional explanations, 'top down' historical inferences would suggest a confluence of events situated around shifts in political influence and dispersal of resources away from royal monumental projects (Cruz-Uribe 1994: 49; Seidlmayer 2000: 122). Hence, it was no longer economically viable to transport stone from distant sources; notably exploitation of Chephren Gneiss from Chephren's Quarry also ended at the same time.

Yet, such explanations largely overlook micro-level social dynamics as also congruent and significant to cessation. If longevity of production is linked to kinship, ancestry and a connectedness with place, then the social transformations that were set in motion, as described, may have been significant in a discontinuity or change in meaning attached to the resource. As Barrett (1999: 27–8) argues, archaeological discontinuities may represent the reworking of the ideological landscape that shifted emphasis to a diverse set of places. Large-scale stone exploitation did not end, but rather it shifted by the sixth Dynasty and became centred largely inside the Nile Valley and Eastern Desert, into the Roman period. Even with the substantial Middle Kingdom and Roman period presence in the Northern Faiyum, attested by the settlements at Qasr el-Sagha and Dimai respectively, there was no return to large-scale quarrying of basalt or gypsum (Bloxam and Storemyr 2002: 28).

Discussion

Shaping of the industrial landscape of the Northern Faiyum can be visualized as a series of transformations contingent on a 'revolution' to large-scale exploitation of basalt and gypsum deposits, associated with pyramid construction, in the early to mid-third millennium BC. The significance of this revolution in transforming the natural landscape of Northern Faiyum is how these primary industries set in motion a series of other interactions that produced the distinctive character and components of the cultural landscape that are visible today. Exploitation of subsidiary raw materials needed either in

the production process, such as for tools, or for elements of infrastructure, such as roads, dwellings and utilitarian objects such as grinding stones, characterizes the industrial landscape of the Northern Faiyum.

In the absence of written records, the human experience of this exponential change to intensive production may be drawn only from its mundane structures, which, as Fowler expresses it, are the 'memorial to the unknown labourer' (2004: 31). The social construction of the landscape implies that the transformation to intensive exploitation of local resources was largely conducted within low levels of social organization, perhaps related to local kin groups. The selection and extraction of certain stone deposits are also congruent with technological innovation, particularly the construction of the paved quarry road. Moreover, with basalt exploitation in the region being attested before the third millennium BC (Mallory-Greenough et al. 2000: 326), knowledge of these resources and the environment may be representative of the nature-culture continuum connected to resource exploitation since the earliest Faiyum Neolithic habitations. Although requiring more extensive survey of the immediate environs, the significance of long cultural and historical antecedents attached to these Northern Faiyum sources may be important in formulating arguments surrounding stone selection.

Although the landscape is in a continual state of transformation by natural forces, such as wind erosion and occasional flash floods, and human influences, such as tourism, modern basalt quarrying and agricultural projects, the authenticity of the industrial landscape still largely remains. As a cultural landscape that 'hovers' between 'relict' and 'continuing' (see Fowler 2004: 102), it may be argued that this continuous transformation in the Northern Faiyum, rather than diminishing the authenticity and integrity of the industrial landscape, has largely acted to emphasize and isolate the Old Kingdom epoch as the period when it was centre-stage in an exponential quest for basalt and gypsum that was never repeated. The global significance of the ancient industrial landscape of the Northern Faiyum as a 'combined work of nature and man' is its projection of the narrative of how stone was extracted, transported and finally crafted to produce elements of the world's most outstanding funerary monuments.

Conclusion

This paper has argued that the industrial landscape of the Northern Faiyum is of 'outstanding universal value' in authenticating a transformation to large-scale stone quarrying in the third millennium BC, an epoch that has global significance in the evolution of monumental stone architecture. Further methodological development by deploying additional formulations in social and landscape archaeologies and extending archaeological and geological survey into the largely undocumented areas between Widan el-Faras, Umm es-Sawan and Kom IV is clearly desirable for future research. However, the intention of this paper has been to construct a preliminary framework to articulate the significance and values of largely mundane production data, as applicable for nomination as a World Heritage site. Although it is beyond the scope of this paper to discuss issues surrounding the conservation, management and presentation of ancient stone quarries in an Egyptian context, the perspectives raised are intended to open up discussion

on how ancient stone quarries in general can be made more visible to national cultural heritage authorities.

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