

New directions in identifying the significance of ancient quarry landscapes: four concepts of landscape

Elizabeth G. Bloxam

*Institute of Archaeology, University College London, 31–34 Gordon Square, London, UK.
E-mail: e.bloxam@ucl.ac.uk*

As a largely forgotten cultural heritage, articulating the significance of ancient quarry landscapes to a wider public is key if such are to be conserved and protected. Given the mundane aspect of the material remains that make up these sites this can be particularly difficult to do. Significance may only be fully understood by decision makers, heritage authorities, stakeholders as well as the broader public if we can find ways to connect ancient quarry landscapes with other places and/or events of more widely known historical importance. When concepts of landscape are deployed as a method of macro-level interpretation into ancient quarry landscapes across the QuarryScapes project study region, we have been able to identify significance in several different ways. For instance, quarry landscapes such as that at Sagalassos in Turkey that are largely invisible, can be holistically significant when they are viewed as telling the greater story of how these resources were utilised in the construction of a major city of antiquity. The extensive and complex quarry landscape of the Aswan West Bank in Egypt can be considered as holistically significant, when viewed as telling the story of human engagement with a specific resource over exceptionally deep time. Explosions in quarrying for specific products may also be of greater significance and research value when viewed as an indicator of profound political and ideological change in history and prehistory. In addition, when extensive quarry landscapes are under pressure from modern development, we can also ‘best project’ where these events can be visualised and authenticated by material remains at specific places in the landscape. The need to separate the scientific values of ancient quarry landscapes that are of interest to experts, from the bigger story that they collectively convey, can be the way forward if we are to build a case for conservation in a more accessible way.

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Introduction

Conservation of any cultural resource needs to address a fundamental question: why should a particular place, landscape or monument be conserved over other types of cultural resource? Finding ways to convey the significance of a cultural resource is thus a key component in approaching this question, which is largely drawn from an assessment of heritage values gathered across a range of perspectives. In the conservation process, these values are put into a 'statement of significance', which heritage authorities, stakeholders and other relevant parties use in the evaluation of a cultural resource. One of the key objectives of 'QuarryScapes' has been to put ancient quarry landscapes on the conservation agenda and it has been important to find ways to articulate the significance of this forgotten heritage in such a way to relevant authorities. Developing a methodology to put across the significance of ancient quarry landscapes in more broadly based terms is thus essential in building a case for their conservation.

As with any cultural resource, ancient quarry landscapes vary greatly in terms of preservation of their material remains. For instance, some ancient quarry landscapes may present all elements related to the stone extraction process such as roads, extraction sites, inscriptions, settlement and other material remains, whereas others may only consist of a few remaining rock outcrops and the odd spoil heap. In addition, their character is essentially mundane when compared with other cultural landscapes, particularly those that comprise monumental structures. It may be said that outside of professional interest, the significance of ancient quarry landscapes as a 'cultural heritage' in themselves is often difficult for non-professionals and heritage authorities to grasp. So, how do we find a way to forward the significance of these 'difficult' landscapes in a meaningful way to others outside of academic disciplines?

This paper presents a summary of how a methodology was developed as a

means to transmit the significance of ancient quarry landscapes in an accessible way to a wider public. It discusses the background to developing 'four concepts of landscape' and their practical application to the extreme diversity of ancient quarry landscapes, as seen through several case studies from across the QuarryScapes project region.

Background

Given their extreme variability in terms of preservation and visibility, ancient quarry landscapes can present us with particular problems when it comes to articulating their significance and value. For instance, we may be presented with quite highly visible landscapes with good preservation of key elements, such as the Aswan West Bank (Figure 1), or those that have become enveloped in modern cities such as Ankara (Figure 2). An ancient quarry landscape may completely lose its identity by being eclipsed by more spectacularly built remains in antiquity, such as ancient cities like Jerash and Petra in Jordan (Abu-Jaber and Al Saad 2007, Abu-Jaber et al. 2007a, b, Al Saad et al. 2007), or Sagalassos in Turkey, where the quarries have largely disappeared by being integrated into the

ancient city (Figure 3) (Degryse et al. 2008). Man-made transformation processes such as multiple quarrying over time, as well as proximity to developing cities and unchecked tourism, can obliterate earlier phases of quarrying. In addition, natural transformation processes such as weathering, can make the visualisation of early tool-making quarries of distant periods such as the Palaeolithic hard to distinguish.

Any conservation strategy has to be realistic and balance protection of key cultural resources with local and national development needs. This is particularly relevant to ancient quarry landscapes when it comes to assessing 'what can be saved' given they can often cover areas upwards of 100 km². As Fairclough (2008, p. 412, 421) points out, conservation approaches should be made from the premise that "...protection of cultural landscapes is not first and foremost about preventing change but managing it...[in]...sustainable historically sensitive directions".

Within this range of parameters, the task of developing a method to identify the significance and value of ancient quarry landscapes needs to be flexible and transferable. Moreover, the mundane nature of the material requires a method to make these inaccessible places



Figure 1. Quarry roads of the New Kingdom and Roman Period on the Aswan West Bank, Egypt.



Figure 2. The cityscape of modern Ankara (Turkey), the arrangement of houses following the contours of quarries used in the building of the city.



Figure 3. Remains of a large house/villa built of rubble situated inside a disused limestone quarry at Sagalassos, Turkey.

accessible and relevant to those outside of professional disciplines such as archaeology and geology. The ‘statement of significance’ is a key document on which hinges future strategies in terms of protection, conservation, and even as the first step to World Heritage nomination, of a cultural resource. This document, aimed at decision makers in cultural heritage, stakeholders and heritage managers, is thus the formal medium through which heritage significance and values are drawn. In essence, as Aplin (2002, p. 18) points out, the ‘statement of significance’ has to provide the justification, from an expert perspective, as to why a cultural resource should be conserved over other forms of land use or development.

There are several key steps involved in drawing up a ‘statement of significance’ that are common to all types of cultural resources, and which constitute the basis of an expert value assessment. Drawing from the works of scholars such as Lipe (1984), Sullivan (1997), Aplin (2002), Mason (2008) and Fairclough (2008) these steps can be summarised as follows:

1. Identifying heritage values.
2. Assigning heritage values to cultural remains at a micro level (the empirical data).
3. Developing a theoretical screen to articulate significance at a macro level and to a scale of heritage values.
4. Creating a ‘statement of significance’.

In developing a strategy and method to draw up a ‘statement of significance’ applicable for ancient quarry landscapes, we have modified these basic steps to make them more relevant to the specific problems presented by the material remains found in ancient quarries. These are summarised below.

Identifying heritage values

Lipe (1984) developed what are still key heritage value terms that can be related to any cultural remains of the past. Yet, certain heritage values may only be applicable within certain domains of interest. For in-

stance, economic, social and aesthetic values are usually assessed at local and national levels and involve stakeholders, managers and other decision makers—such values being integrated into the final ‘statement of significance’. From our expert perspective (geological and archaeological), the key values that we use to assess a cultural resource are *historical* and *informational* value. These are defined by Lipe (1984, p. 2–8) to give meaning and importance to cultural remains in this way:

Associative/symbolic value (historical value) — the essence of physical cultural remains and their authenticity, even if re-used, that can transmit cultural information about the past. These are powerful symbols of the past that can also be bound up in ‘Communal value’ in terms of collective memory for those who relate to it by proximity, but also in terms of society’s needs for continuity through time.

Informational value — emerges from formal ‘expert’ research, in particular from multidisciplinary approaches and having to make ‘best projections’ of what kind of resources/elements will be most useful for future study.

Although these definitions are largely in the domain of Western value systems, there is arguably a universal aspect to them in the expert domain. Noting that even within Western perspectives of value, statements of significance may often be contradictory, given that ‘heritage’ is multivalent and corresponds to different stakeholders and contexts that are not fixed (Lipe 1984, p. 2, Sullivan 1997, p. 19, Mason 2008, p. 100). As Mason (2008, p. 114, 119) points out, rather than collapsing all values to form a whole, the statement of significance should rather identify the main themes of significance in the experts’ field and isolate these judgments from others outside the field.

Assigning heritage values to cultural remains at a micro level (the empirical data)

The physical remains of ancient quarrying, or the empirical data that is left across a landscape related to quarrying of a stone

resource, can include roads, settlements, harbours, inscriptions and production remains such as spoil heaps and tools. As discussed above, all these elements can range enormously in terms of their visibility and preservation. In addition, ancient quarry landscapes are the product of resource exploitation that may have occurred over great time depths and so leave multiple traces over time. Hence, we have to find ways to disentangle, identify and characterise these layers and different types of material remains as a baseline to assigning values. Given that all ancient quarry landscapes to a greater or lesser extent comprise one or all of these key elements, to do this, four main categories of characterisation were designed that are summarised below: (i) the *Resource* or actual stone deposit; (ii) *Production remains* such as quarries, tools and discarded products; (iii) *Logistics* or infrastructure laid down to remove the stone products from the quarry; (iv) the *Social infrastructure*, or the remains left by the people who worked in the quarry, such as settlements, inscriptions and ceramics (Bloxam and Haldal 2008, p. 21, table 3, and Haldal 2009).

Although historical and informational value may be assigned to one or more of these key elements, cultural landscapes by their very nature are dynamic and so represent layering of ranges of material culture, sometimes not directly associated with quarrying, across time and space. As Mason (2008, p. 120) points out, the historical value of a building is not necessarily the sum of the building itself, but its relationship with other material remains and other landscape elements. Moreover, delineating values to ‘complexes’ of material remains or ‘sites’ within a landscape allows for all the elements that make up a particular ‘historical complex’ to be taken into account (in the planning process), no matter what their particular nature, visibility or preservation. Hence, identifying and assigning values is linked to how they are embodied in particular ‘complexes’ of material remains.

Deploying such a method to ancient quarry landscapes led to the development of the notion of the ‘quarry complex’

(Bloxam and Heldal 2008, p. 118–133, also see Heldal 2009 for more detailed overview) as a way of identifying collections of quarry elements that may be related to each other in time, space or function. So, rather than viewing a quarry landscape as collections of four quarry elements (resource, production, logistics and social infrastructure) the ‘quarry complex’ gives us the opportunity to group these elements in many different ways and so allowing for historical and informational value to be assigned in a much more flexible way. In addition, to the non-expert, a delineation of values can be seen to be embodied in two ways: first, onto individual material remains, and second, in a collective way as material complexes. Hence, this can aid significantly in identifying where complexes of materials or ‘sites’ that hold key values are located. This is particularly important when pressure from modern development requires ‘best projections’ to be made, in terms of which sites or complexes of material remains in a landscape should be conserved over others.

Developing a theoretical screen to articulate significance at a macro level and to a scale of heritage values

Assigning informational and historical values to micro-level material remains and quarry complexes rests greatly in the domain of expert assessment, and aspects of technology, logistics and the social organisation of quarrying hold key values from this perspective. However, to the non-expert and broader audience, who may often have no interest in the technologies of ancient quarrying, significance and value needs to be transmitted in a far more wide-reaching way. In addition, people need to know at what comparative scale the site’s significance and value is comparable with others, i.e., at a local, national or international level. To identify these broader aspects of significance, as Aplin (2002, p. 18–20) proposes, a theoretical screen or conceptual framework has to be developed to view

the material remains in terms of assessing a scale of values.

In essence, the methods of value assessment described up to this point have been concerned with assigning historical and informational value at a micro level, and so now we need to turn our attention to the macro level in terms of the broader historical significance of cultural resources. Developing theoretical screens that enable us to get at the broader significance and value of quarry landscapes that are diverse in terms of the visibility, preservation and multilayering of remains over large areas, is particularly challenging. We also have to remember that a quarry complex may only consist of a few traces of the resource and production evidence may only be represented by a few tool marks, with no evidence of the social infrastructure. At the other end of the scale, an ancient quarry landscape may comprise several quarry complexes with rich and diverse material remains of multiple periods. So, does this mean that the quarry complex with fewer traces is less significant than the one with numerous traces?

To grapple with such questions it is necessary to construct analytical approaches that identify a range of ‘value contexts’ in the light of such diversity. Accordingly ‘four concepts of landscape’ were designed as a baseline theoretical screen through which we can articulate macro-level value contexts of ancient quarry landscapes. In essence, the idea is to find ways of articulating the significance and value of a site within its broader geographical and historical context, however diverse its material remains, or in other words, the degree to which it has connections to other places and/or historical events.

Four concepts of landscape

1. *Socially constructed landscapes*: this concept can be used to isolate values of multiperiod quarry landscapes in terms of the time depth of the quarrying as well as the use and reuse of the landscape for other activities. Authenticity of cultural remains are key to assessing historical values, although often ancient quarry landscapes can lose the ‘authentic’ remains of earlier quarrying

as a result of later quarrying and reuse. To identify the significance of these multiple traces of quarrying over time, and its connection to other activities occurring across the landscape, the concept of a ‘*socially constructed landscape*’ allows for the historical context to be assessed holistically. Stone-working traditions, aspects of ancestry and connection to a landscape, are key concepts to identify. Contributions from landscape archaeology, anthropology, ethnography and social archaeology (Ingold 1993, Barrett 1999, Cooney 1999, Knapp 1999, Ucko and Layton 1999, Bradley 2000, Thomas 2001, Grzyski 2004) are key theoretical sources that can aid in reconstructing the social landscape and from which historical values might be linked to specific material resources.

2. *Contact landscapes* (consumption): ancient quarry landscapes do not exist in a vacuum but have connections with other places, often thousands of kilometres away, through consumption of their products. In some instances these contacts may be extremely close to a quarry landscape and may be related to providing stone for a major city or monument of enormous historical importance. Part of the historical significance of the ancient quarry, although this may be hard to visualise and attach to actual physical remains, comes from its connection to another more highly visible and significant place. Consumption of stone from a particular resource over a wide geographical range can also be historically significant, in terms of identifying ancient trade patterns and values placed on particularly sought-after resources over time. These contacts may also be significant in terms of identifying cross-cultural social relations between people, centred on the trade and consumption of a stone resource, that places the ancient quarry landscape at the epicentre of these connections.
3. *Associated historical landscapes*: at a macro level, some ancient quarry landscapes may be implicated in and provide additional evidence about sig-

nificant events and transformations in history and prehistory. For instance, political and ideological change at key periods in history may provoke intensive production of a specific resource due to its symbolic association with an emerging religious cult. Quarries can also be key places to identify changing social relations in the transformation of early states, particularly where monumentality and large-scale raw material procurement were key indicators of an emerging political elite. Dramatic intensification in quarrying for utilitarian objects from a specific resource, such as grinding stones, may tell us about major changes in diet and methods of food processing at key transformative stages in prehistory. Important insights into past environment may also be directly and indirectly evident at ancient quarries. For instance, methods of stone transport and types of infrastructure may provide evidence of once easy accessibility to water in now hyper-arid environments. Technological changes in society over time can also be reflected in quarries, for instance, the introduction of iron technology into quarrying.

4. *Dynamic landscapes*: quarry landscapes, as with any type of landscape, are dynamic places that are not static in time. Although the concept of a '*socially constructed landscape*' allows us to view multiperiod transformations as adding new layers of historical significance, directly or indirectly related to quarrying; how do we articulate values of quarry landscapes where reuse for other activities may have completely or partially destroyed them? The aim is to view the landscape holistically from a perspective of how human agency into the present may have totally changed an earlier landscape and what threads of these past elements have been inherited and still survive. Aspects of this approach have been incorporated into methods relating to Historic Landscape Characterisation (Fairclough 2008, p. 414) and form the basis of this macro-level concept. This is a particularly useful concept to use when a quarry landscape has been to-

tally integrated into a modern city and where we need to assess historical and informational values through human agency as characterising the *present-day* landscape, rather than its past.

The idea is not to analyse an ancient quarry landscape through just one of these concepts, as more often than not the diversity of material remains and their status of preservation may mean that significance has to be articulated in several ways. These concepts have been developed more as a way to remind us of the flexibility that there can be in identifying significance and most importantly, that significance is culturally and socially specific and therefore variable from country to country.

Values in terms of scale

The final step in the assessment of historical and informational values, at both micro- and macro level, is to inform decision makers and heritage authorities as to the scale to which these values can be assigned to an ancient quarry landscape and its material remains. The key terms of reference for assigning scale to a cultural resource, as forwarded by Aplin (2002, p. 20) have three dimensions:

1. *Scale*: something may be important to a local community, region, state, nation or globally.
2. *Importance*: how important is it at the appropriate scale and why.
3. *Either uniqueness or representativeness*: this can be a unique case such as the last remaining, or a representative example of a type.

At a macro level, deploying the four landscape concepts allows for historical and informational value to be assessed by analysing the quarry landscape holistically, rather than as individual areas, sites, or complexes of material remains. The assessment of scale comes by comparative analysis of the quarry landscape against others at local, regional, national and international levels. At the top end of the scale, the historical and informational value of an ancient quarry landscape may rest in the totality of its material remains as laid down over time as representing a nar-

rative of human exploitation of a resource that is of global significance. To this end, a statement of significance may urge decision makers and heritage authorities to consider World Heritage nomination of the cultural landscape. At the lower end of the scale, a site's significance may only be important, as a representative example of a type at a local level.

Yet, quarry landscapes can also present complexes of material remains within them that may vary greatly in terms of their historical and informational value in terms of scale. Moreover, we can never present to decision makers conservation planning options that only adhere to the view that 'all must be saved'. Conservation has to be balanced with modern development needs, and the expectation that 'whole' landscapes, sometimes covering upwards of 100 km², should be saved has to be based on strong arguments based on global significance. Consequently we need to provide decision makers with two views of heritage values: first, as a total 'landscape' entity and second, to 'best project' where particular material remains or 'quarry complexes' might, in terms of scale, have more historical and/or informational value than others. In other words, we have to look at a relative scale of these values at a micro as well as a macro level. For instance, a particular 'quarry complex' of material remains may represent the best preserved example of one of the world's oldest quarry roads and so its historical and informational value may be assessed as significant at a global scale. Whereas other parts of the same quarry landscape may be assessed as having historical and informational value only at a national level.

'Outstanding universal value': global significance, authenticity and UNESCO criteria for establishing World Heritage Status

'Outstanding universal value' of a cultural resource, be that a single monument or entire landscape, is the highest level of scale that can be attained. The four concepts of landscape described above can be a useful method to gauge if an ancient quarry landscape, or elements within it,

may fit into such criteria. Nomination documents for World Heritage status are, similarly, primarily based on the articulation of significance at the broadest level and where identifying a scale of values is key. Criteria for assessing values for World Heritage nomination are thus useful additional concepts to apply, particularly when assessing landscapes holistically (UNESCO 2008). Importantly, it grapples with the question of authenticity of cultural remains and the difficulties inherent in defining this as a criteria for assessment when cultural landscapes are, by their very definition, dynamic and comprise material culture that can represent several historical periods (von Droste 1995, p. 22–23, Cleere 1996, p. 228–229, Titchen 1996, p. 236–237). After the Nara Conference on authenticity (UNESCO 1994) a more open and flexible approach to the concept of authenticity and cultural landscapes as representing ‘the combined works of nature and man’ allowed for the distinctive character and components of a landscape across multiple periods to be recognised (Mitchell 1995, p. 245, von Droste 1995, p. 22–23, McBryde 1997a, Jones 2003, p. 40, Fowler 2004, p. 5). Such modification of this key criteria has allowed for the inclusion of ‘industrial landscapes’, that may have evolved over several millennia, to be considered as World Heritage Sites. Out of the current sixteen ‘industrial landscapes’ listed as World Heritage Sites (Jokilehto 2005, p. 78) none are related specifically to stone quarries in their own right. The need to redress this imbalance means that we should be thinking more seriously, when making a value assessment of an ancient quarry landscape, about whether ‘outstanding universal value’ can be applied in certain cases.

The concept of ‘outstanding universal value’ has recently been used in the assessment of significance of two ancient quarry landscapes in terms of World Heritage status: the Northern Faiyum (Bloxam and Heldal 2007) and the Aswan West Bank (Bloxam 2007a). Key to this methodology was how we conceptualise the significance of the transformed landscape across time and its social construction, in essence as a ‘socially constructed landscape’ that in-

corporated theoretical approaches from social archaeology and landscape archaeology (Ingold 1993, Ashmore and Knapp 1999, Barrett 1999, Ucko and Layton 1999, Thomas 2001). Deployment of these concepts allowed us to get at aspects of the ‘human experience’ of quarrying in the past and its significance in terms of time depth.

Creating a ‘statement of significance’

The ‘statement of significance’ is where we formalise the results of the historical and informational value assessment, from an expert perspective, of an ancient quarry landscape. This document has to be accessible and meaningful across a range of interests from those of decision makers in heritage authorities to local stakeholders and is where macro-level interpretation and the articulation of significance in broad historical terms is key. Moreover, it is where guidance is given, in terms of micro-level material remains, as to which sites, or (quarry) complexes of material remains in a quarry landscape provide ‘best projects’ historical and informational values at a relative scale.

Into this document, other values such as the aesthetic, economic and social are added, the assessment of which lies in the domain of identified local stakeholders and other interest groups. Moreover, such assessments would be made with regard to national legislation and other legal frameworks at local and national levels. Accordingly, as several commentators have remarked, there is the expectation that statements of significance will often be contradictory, for instance, historical value may be in conflict with aesthetic value and so there is clearly no imperative for reflecting a universal view (Sullivan 1997, p. 19, Mason 2008, p. 119).

Towards a statement of significance: applying the notion of ‘four concepts of landscape’ to ancient quarry landscapes—case studies from across the Quarry-Scapes project region

The methodology described above and key definitions relating to the idea of four concepts of landscape have both been summarised in Figures 4 and 5, respectively. But how, in practice, do

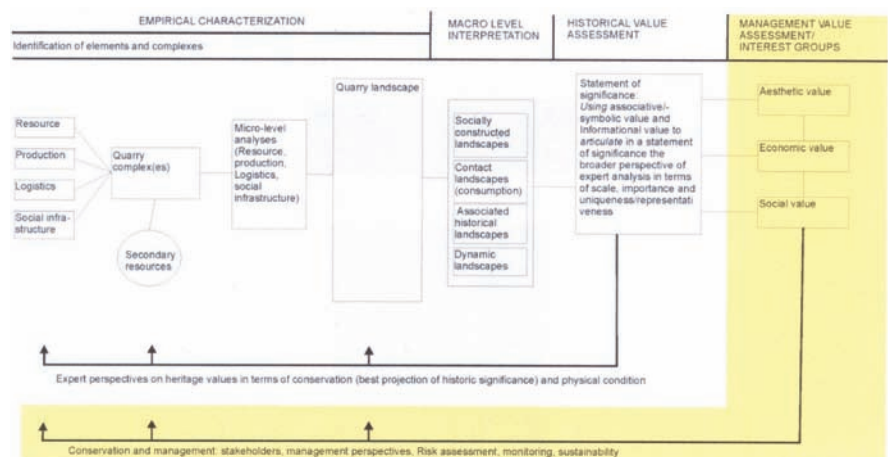


Figure 4. Steps in the process of making a ‘statement of significance’ from an expert perspective specific to ancient quarry landscapes (white area). Value assessments (yellow) are those identified by stakeholders, managers and other decision makers involved in the conservation planning process.

Socially constructed	Traditions, other use of landscape, ancestry, re-use
Contact	Consumption, trade, exchange
Associated historical	Connections to political, ideological and technological changes and evolutions
Dynamic	Transformations of landscape, re-use, present day situation

Figure 5. Four concepts of landscape: a summary of their key attributes.

we apply this method to ancient quarry landscapes? To test this method, specific ancient quarry landscapes have been selected from across the Eastern Mediterranean QuarryScapes project region as case studies that represent the diversity of material remains that can be encountered. This diversity is represented in terms of preservation, authenticity, time depth and geographical location in relation to other monuments, or ancient cities which consumed their products.

Socially constructed landscapes

The Aswan West Bank in Upper Egypt presents us with a key example of how an ancient quarry landscape can comprise material remains of extreme complexity, spread over an area of 60 km² (Figure 6). QuarryScapes geological and archaeological surveys of the landscape revealed a hitherto unknown deep history to silicified sandstone quarrying here, from the early toolmakers of the Lower–Middle Palaeolithic into the Roman Period (Bloxam et al. 2007). Consequently,

the landscape has been transformed by the exploitation of a single resource that may have commenced up to one million years ago. Apart from the range of silicified sandstone quarries that cover such a large time depth and their associated infrastructure, there are additional material remains from other activities that occurred across the landscape at different times. These activities, such as hunting via game drives, development of desert transport routes and burials of the elite in the Dynastic Period, may have occurred in conjunction with quarrying. In addition, significant material remains were also laid down *after* quarrying ceased to be a core activity, for example, the building of monasteries and use of areas for burial (Bloxam et al. 2007, p. 201–202, Storemyr 2007, p. 163–181). In other words, there were periods when the landscape was socially reconfigured for other activities.

In terms of the ancient quarry landscape as a whole, the material remains present great complexity associated with many time periods, often overlying each other and spread over a large area (60 km²). Consequently, even from preliminary analysis it is possible to see that the historical and informational values of the landscape rest largely in its totality as a cultural landscape. Yet, how do we make this accessible to heritage authorities and make a case for conservation in such terms? In particular, assigning secure chronological sequences to all these phases of quarrying and other activities when we often encounter poor visibility of material remains as well as data gaps. However, the concept of ‘*socially constructed landscape*’ that can be applied to the total landscape allows us to grasp significance as not being attached to specific ‘sites’ or to sets of material remains, but identifies historical values through ancestry, longevity and connections to the landscape that include all activities that occurred across it. Thus, it provides a medium with which to view the narrative of a landscape as represented in its totality.

First we needed to deconstruct the landscape into the four elements of ma-

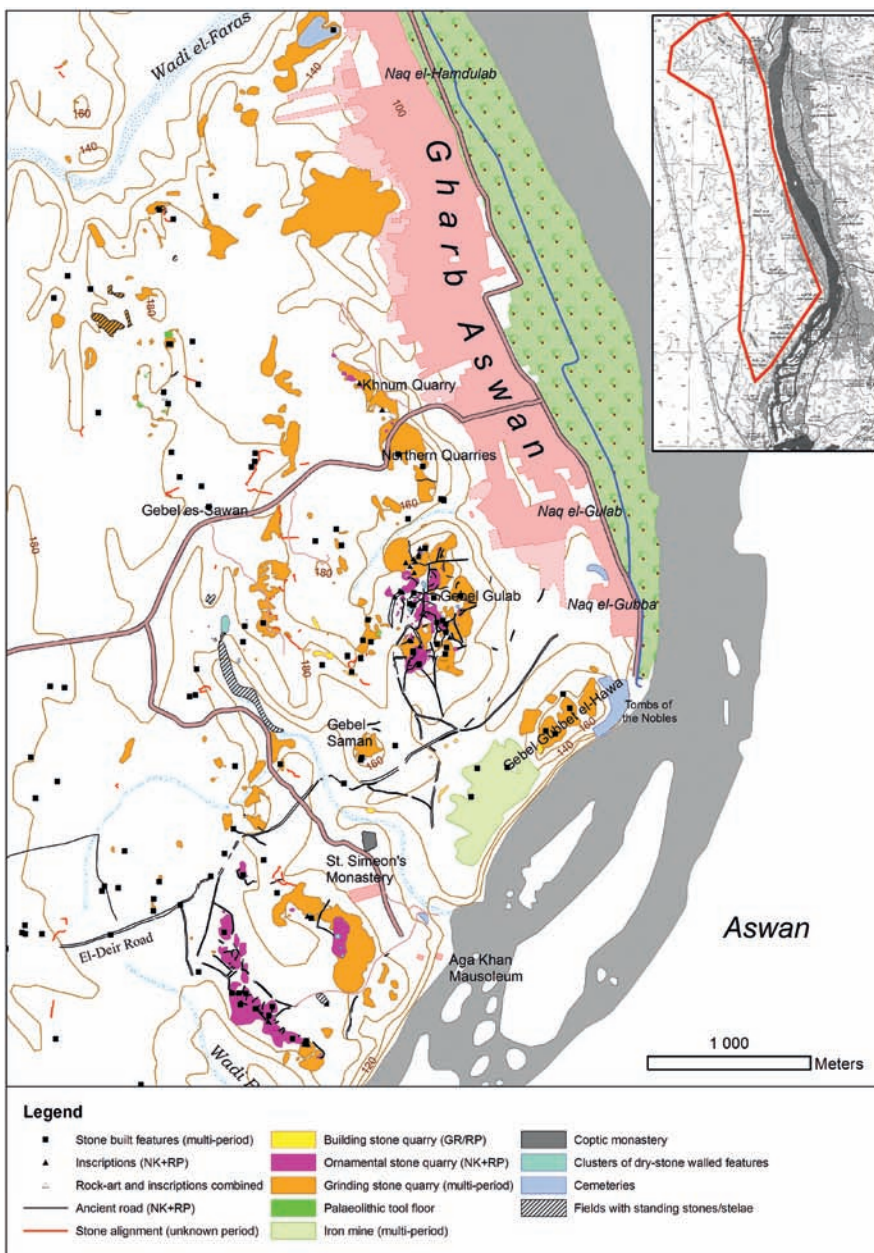


Figure 6. Map of the Aswan West Bank quarry landscape. Detail map shows key areas of archaeological remains and quarries mapped during the QuarryScapes survey. Insert map (top right hand corner) shows the overall extent of the quarry landscape (map produced by Tom Heldal and Per Storemyr).



Figure 9. Prehistoric rock art near grinding-stone quarries, Gebel es-Sawan North, Aswan.

tions that link people with specific places in the landscape, has come specifically from research of Australian aboriginal culture (McBryde 1997b). Evidence, comparable with that of the Aswan West Bank, has been archaeologically attested over deep time in aboriginal culture, and research has shown the important role that grinding stone production played in maintaining social relations and links with ancestors. Grinding stone quarries were also incorporated into ‘dreaming tracks’ and were continually revisited over time as special places in the landscape (McBryde 1997b and Bloxam 2007a for a more detailed explanation).

In effect, the concept of a ‘socially constructed landscape’ can help in identifying the historical significance of an extensive grinding stone complex in its totality, and describing a rare perspective that links quarrying of a single object with the dynamics of social life on the West Bank across deep time. When grinding stone complexes lie side by side with the ‘dynastic ornamental stone complexes’, such as at Gebel Gulab and Khnum quarries (Bloxam et al. 2007, Bloxam and Heldal 2008, Heldal 2009) it is possible to use such a perspective to view the extent to which changes to large-scale object quarrying may have impacted on local social relationships. The key to such changes

would be any indications from the material remains that characterise the hand of the ‘state’ and ideas of any monopoly of the resource (see Bloxam 2007a). Although a significant enhancement in production techniques linked to large-object quarrying can be identified, as can its logistical infrastructure, it is not possible to attest from micro-level social infrastructure that these transformations impacted significantly on the social context of quarrying at this time (Bloxam 2007a, p. 13–14). In addition, there are

no indicators of ownership or restricted access to the resource. Yet, it is possible to identify a continuity in inscribing of the landscape, particularly related to local gods and those that attest to symbolic links between silicified sandstone and the solar cults (Figure 10) (Bloxam 2007a, p. 7–11).

In essence, we get a sense of continuity even through periods when resource exploitation transformed the landscape quite significantly. We may be able to visualise this continuity through the inscribing of the landscape and from grinding stone production as key activities that linked people, perhaps in kin groups, with these places through ancestry. We may consider that restriction of access to this resource, rather than materially visible, was socially constructed via such groups over time (Bloxam 2007a, p. 13). As suggested, perhaps ‘social restriction’ may be embodied in the fact that the grinding stone production methods, their shape and other attributes imply continuity with little change over time, something that would not be expected if procurement was open to ‘outsiders’ or transformed into a monopolised industry (Figure 11).

The concept of a ‘socially constructed landscape’ allows us to include all material remains of a landscape, even where authenticity has been compromised by



Figure 10. New Kingdom (2nd millennium BC) rock engravings: left image depicts a lion/lioness that can be associated with the wrath of the sun god. Right depiction of the baboon usually associated with solar worship. Khnum Quarries, Aswan West Bank.

later activities, to be historically significant. Today, artisan quarrying for local house building indicates that these resources remains important places (Figure 12), and although such low-key activities today may continue to impact on authenticity, it helps us visualise how the dynamics of this landscape extend into the present day. In sum, historical and informational value lies in the fact that the landscape's totality has no clear boundaries and it authenticates a rare 'storied' landscape, which at its core, tells us about human engagement with its natural resources from the earliest tool makers of the Lower–Middle Palaeolithic to the present.

Statement of significance: the Aswan West Bank

In drawing up a statement of significance for the Aswan West Bank, it is necessary to evaluate the outcomes of this assessment of historical and informational values in terms of scale. It is then possible to compare the landscape holistically with other known ancient quarry landscapes locally, nationally and internationally. Viewing the Aswan West Bank as a 'socially constructed landscape' a strong case can be presented for the Aswan West Bank being of 'global' significance, as it represents a unique case in being the last known ancient quarry landscape where exploitation of a single resource can be characterised through deep time from the earliest tool makers. Key places across the landscape can be isolated that characterise this longevity, largely in terms of the grinding stone complex. If global historical and informational values can be attributed to an ancient quarry landscape, then the statement of significance would indicate to decision makers that there is a strong case for World Heritage nomination through UNESCO criteria of 'outstanding universal value' (see above and Bloxam 2007a, p. 15–18, where this is discussed further).

Value assessments by decision makers and stakeholders would be urged to take further this holistic view in terms of assessing economic, aesthetic and other values that fall in their domain.

Moreover, in terms of the Aswan West Bank, World Heritage sites already exist in the locality to the south and east (see Storemyr et al. 2007, p. 179) and the importance of making efforts to expand these already existing boundaries northwards up to the Wadi Kubbaniya can be stressed. Although viewing the landscape in its totality is key to identifying global significance, key areas, or 'best project' can also be isolated where material remains and quarry complexes characterise historical and informational value in their own right. This is discussed below.

Contact landscapes

This concept has been designed to identify historical values of an ancient quarry landscape holistically due to its connections, via consumption of its products, with other places of historical significance. This concept can only be applicable if expert analyses can provide secure evidence of connection between the resource and the consumption of its products in a given depositional context. In relation to the Aswan West Bank, deploying the 'contact landscape' concept would be problematic given that the source of silicified sandstone objects still needs further research.

The 'contact landscape' concept can be

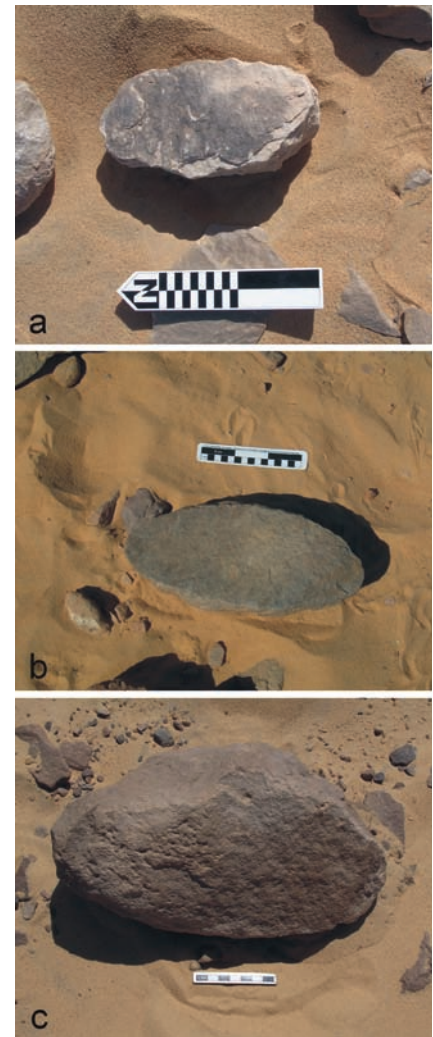


Figure 11. Grinding stone rough-outs: (a) Late Palaeolithic; (b) New Kingdom; (c) Ptolemaic–Roman Period.



Figure 12. Present-day artisan quarrying for house building on the Aswan West Bank.

applicable to ancient quarry landscapes where deposition of its products can be in close proximity to the resource, such as a city of major historical significance, and/or may have been incorporated into important monuments more distant from the resource. In addition, distribution of products may occur even further afield, as many quarry landscapes of antiquity became sources of stone that were distributed widely across the ancient world, and so we may say that they were at the epicentre of great trade systems (Bloxam and Haldal 2008, p. 142). This concept also takes a holistic approach to a quarry landscape, similar to *'socially constructed landscapes'*, and is particularly applicable when it is difficult to make a strong case for historical and informational values being attached to specific material remains therein. For instance, there may be scant if any remains that characterise the social context of quarrying and logistics. Or in other words, as opposed to the Aswan West Bank, the quarry landscape may not stand comparatively well in terms of a scale of values, either locally, nationally or internationally, in its own right.

Quarry landscapes in direct proximity to historically significant cities or monuments of antiquity may almost completely lose their identity and authenticity. In some instances, this is because they were almost entirely incorporated into the fabric of the historic city, or in others, totally eclipsed by their proximity to spectacular monumental sites such as the Giza Plateau Pyramids, or the city of Petra. However, in both instances, their proximity to such key monumental sites usually means they are protected and conserved by default, as they fall within the boundaries of such heritage sites. The quarries in the city of Sagalassos are typical examples of the former, where the few remains of the resource have been reused as foundations of later buildings and/or as structural walls (see Figure 3). Survey of the quarries at Sagalassos and their chronological use for building the city, has provided new perspectives for interpreting the city's evolution (Degryse 2007, Degryse et al. 2008, p. 281–287).

Here, the extent to which these resources were consumed to create the city goes as far as incorporating spoil heap material into the construction of buildings, contributing further to the almost complete invisibility of some of the quarry complexes surrounding Sagalassos. Significantly, the resource was also consumed for an entirely different purpose, such as burials, whereby many of the building stone quarries take on the identity of necropolis that surround the city (Degryse et al. 2007, p. 19–20, Degryse et al. 2008, p. 272–276, 287–288). The burials are either directly into the resource, or sarcophagi were quarried from extracted

blocks, used and deposited almost in the same context (Figure 13) (Degryse et al. 2007, 2008).

Statement of significance: Sagalassos
 Within the concept of a *'contact landscape'* it is possible to make an historical and informational value assessment of the scant remains of the quarry complexes of Sagalassos within their broader context as being integral to the city. Importantly, such a statement would focus historical values where the idea of *'contact through consumption'* has almost entirely consumed a stone resource. The few extant remains of the quarry complexes that sur-



Figure 13. Quarries transformed into burial places, Sagalassos, Turkey.

round the city authenticate and provide key historical and informational value as to how building of an ancient city, and burial of its dead, profoundly impacted on local resources over a relatively short time depth (appr. 700 years).

In assessing historical and informational values in terms of scale the task is less easy, as there are little comparative data from other quarry landscapes in Turkey. However, several Roman Period cities in Turkey, such as Termessos, also heavily exploited local resources for buildings and burials (Pekridou 1985, Roos 1985). Hence, the Sagalassos quarry complexes are not unique on a national or global scale, although they are representative of a specific type of 'contact through consumption' quarry landscape that is important at local and regional levels. It is also important to include the Sarıkaya quarries, located 5 km from the city, and which are part of the 'greater' Sagalassos quarry landscape, into any significance statement (Degryse et al. 2008, p. 279–281). Characterised by one large remaining quarry face (Degryse et al. 2008, p. 280) these quarries are also part of this 'contact landscape' given that consumption included stone from this resource. Unlike the quarries immediately surrounding the city, the authenticity of Sarıkaya is gradually being compromised by modern agriculture. In terms of informational value, these quarries are key in determining the largely unknown 'internal' logistics within the greater Sagalassos quarry landscape.

Associative historical landscapes: the Aswan West Bank

As discussed earlier, it is necessary to find ways to connect quarry landscapes, or complexes within them, to key events of historical significance. 'Best projections' are vital to a statement of significance, particularly if a quarry landscape is under pressure from modern development.

The concept of an 'associative historical landscape' can only be applicable where secure dateable contexts related to material remains exist. In addition, it is necessary to have other sources of information (from written sources) that

can provide the contemporary historical backdrop to quarrying of the resource. Such information would largely have been assessed during micro-level interpretation (Bloxam and Heldal 2008, p. 19–112). As with the previous landscape concepts, 'associative historical landscapes' might be applied to an ancient quarry landscape in its totality, but only if the material remains are largely related to one historical epoch. For example, in the Northern Faiyum (Caton-Thompson and Gardner 1934, Harrell and Bown 1995, Bloxam and Storemyr 2002, Bloxam 2003) and at Chephren's quarry in Upper Egypt (Engelbach 1933, 1938, Harrell and Brown 1994, Shaw and Bloxam 1999, Bloxam 2003), extensive quarry landscapes are largely related to Old Kingdom quarrying and so are key places where the transition to the early Egyptian state, characterised by monuments of global significance (the pyramids), can be associated with an almost revolution-like change to 'industrial-scale' quarrying at these places (Bloxam and Heldal 2007, Bloxam and Heldal 2008, p. 143).

For the purposes of this case study we shall return to the Aswan West Bank, because its multiple period and complex material remains present the most challenging example of how the concept of 'associative historical landscapes' can work. Moreover, it provides an important case study into how to make 'best projections' of historical and informational values across such an extensive and complex landscape.

To make 'best projections' or define boundaries around complexes of material remains that need to be preserved over others, we need to be able to clearly assign historical and informational values to those that best authenticate and can be connected with historically significant events. The 'dynastic ornamental quarry complex' at Gebel Gulab and Khnum quarries is one area where we can demonstrate this, because they provide additional indirect evidence towards understanding a key transformative stage in the mid 2nd millennium BC.

The historical backdrop to early New

Kingdom (18th Dynasty, 1550–1295 BC) quarrying for ornamental objects on the Aswan West Bank is set against the reign of Amenhotep III and his solarising of the major cults of Egypt. At this time, the king identified himself with the sun god Ra and became the key religious orthodoxy (Kozloff et al. 1992, p. 76, 110). The implications of this ideological and religious change had a direct connection with the explosion of silicified sandstone quarrying on the Aswan West Bank, due to the 'solar' symbolism attached to the stone's properties (Baines 2000, Quirke 2001, Bloxam 2007b). Arguably this reached a peak during the Amarna Period, where large-scale use of the stone led to the creation of some of the finest objects (Figure 14) (Bloxam 2007b, p. 44–45). The ancient quarries at Gebel Gulab and Khnum quarries specifically authenticate this New Kingdom explosion in ornamental stone quarrying in the form of partially finished objects, ceramic data, transport infrastructure and epigraphic data related to solar cults (Heldal et al. 2005, Bloxam et al. 2007, Bloxam and Heldal 2008, p. 127–129) (see Figure 1).



Figure 14. Head of Nefertiti in silicified sandstone, Amarna Period (New Kingdom 18th Dynasty). Egyptian Museum, Cairo.

After a brief hiatus, Seti I of the early 19th Dynasty (1294–1279 BC) reinitiated silicified sandstone quarrying for ornamental objects in his desire to model himself on Amenhotep III (Brand 2000, p. 128, 360). However, his ambitions to remove large objects from Gebel Gulab and Khnum quarries were never realised, given his early death after only 15 years as king. The remains left from this last episode of New Kingdom ornamental quarrying, particularly at Khnum quarries where an obelisk base and two partially worked statues and/or obelisks remain unfinished, lie as testament to these unfulfilled ambitions (Figure 15). Although this period of large-scale exploitation is only a minor blip (80 years) in the history of quarrying across the Aswan West Bank, it tells us about key historical changes that led to the laying down of the most highly visible infrastructure across the landscape.

What about the less visible material remains of ancient quarrying? In several areas across the Aswan West Bank there are other complexes of much more mundane and hard-to-see material remains where ‘best projections’ of historical and informational values should also be made. For instance, the earliest period of grinding stone production at Wadi Kubbaniya dating to the Late Palaeolithic. Particularly hard to visualise, these material remains authenticate and can be associated with a key transformative period in Egyptian prehistory linked to two main themes: the greater use of stone types in the manufacture of tools and a change in subsistence patterns that broadened from just hunting to include (wild) floral resources such as wild wheat, barley and nut-grass tubers (Wendorf and Schild 1989, p. 820–821). Some of the earliest known semipermanent settlements of this period where these subsistence

changes occurred are located in the Wadi Kubbaniya (Figures 16 and 17). It is also here where we can associate how such transformations can be connected with a dramatic increase in silicified quarrying for the objects necessary to process these floral resources: grinding stones (Figure 18). Associated with the remains of one of these earliest semipermanent settlements of the Late Palaeolithic (18,300–17,000 years ago), the exploitation of silicified sandstone sources 300 m away authenticate where the story of grinding stone quarrying across the West Bank began at this key phase in prehistory (Roubet 1989).

Statement of significance: the Aswan West Bank and ‘best projections’

With reference to the ‘dynastic ornamental stone complex’ we can identify historical and informational values in two ways: first, in specific elements of mate-



Figure 15. Partially worked large object of the New Kingdom late 18th–early 19th Dynasty (Osirid statue or truncated obelisk) still attached to bedrock in Khnum quarries, Aswan West Bank.

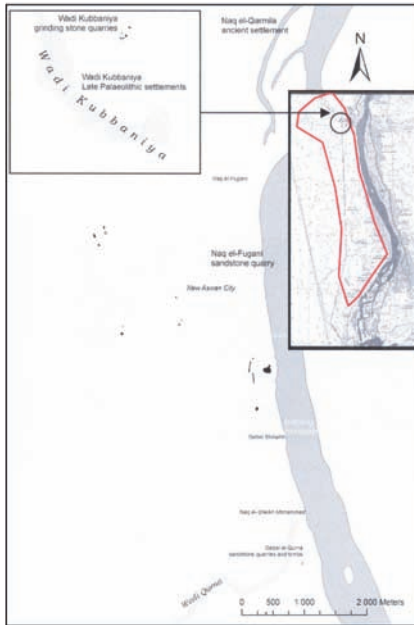


Figure 16. Main map shows location of the Late Palaeolithic settlement and associated grinding stone quarries in the Wadi Kubbaniya, Aswan West Bank. Inset map shows their location in terms of the Aswan West Bank ancient quarry landscape as a whole.

rial remains at a micro level; and second, within the complex as whole in terms of its historical significance at a macro level. For instance, at a micro level, historical and informational values would be specifically connected with the networks of quarry roads on and near Gebel Gulab. In terms of scale they would be of global importance, as they probably represent the best preserved examples of an ancient road system linked to quarrying from this period of the 2nd millennium BC. In addition, they form the most visible aspects of this quarry landscape. Hence, we could argue for global historical value and also informational value in what this road system would yield about still poorly known aspects of overland transportation at this time.

The quarries and social infrastructure, however, have comparable and in some cases better, material examples as observed in the granite quarries on the Aswan East Bank (Klemm and Klemm 1993, Klemm and Klemm 2008, p. 233–249, also see Kelany et al. 2009). Historical values may only occur at a local scale of importance, although as informational value, where direct connections between stone properties, symbolism and royal

consumption in antiquity can be characterised, this would be at least of national importance. These ‘best projections’ and those assigned to other areas of material remains would then be combined with the assessment made holistically of the landscape. Figure 7 shows how these can be represented on an overall map. Thus providing decision makers with several planning options and onto which other values would then be added.

Dynamic landscapes

This concept is an approach to how we articulate historical and informational values of a quarry landscape where authentic material remains are almost completely integrated into modern developments, such as a city. Hence, the quarry landscape is characterised through elements linked to other purposes, such as buildings and how they occur across a ‘cityscape’. It is possible, of course, to apply this concept to places such as Sagalassos, and at the other end of the scale to the Aswan West Bank, in terms of past and more recent reuse (Storemyr et al. 2007), and it is important to be aware that there are many contradictions when it comes to evaluating acts of destruction and reuse (Bloxam 2007c, p. 119–131).

It is necessary to think about macro-level interpretation of quarry landscapes in terms of where authentic remains are almost totally compromised and to articulate and project historical and informational values onto the ‘living’ cultural landscape.

The quarry complexes surrounding Sagalassos were part of such dynamics in the past and it is possible to see that integration into the city ‘frozen’ in time, given that they are under protection by the antiquities organisation (Degryse 2007, p. 64–65). Use of the concept of ‘*dynamic landscapes*’ provides a way of visualising such processes *in action* in, for example, modern cities that are still evolving. In some instances the way that buildings are located, sometimes irregularly across a city skyline, may indicate their placement inside or on top of disused quarries (see Figure 2). For instance in Ankara, creation of the city over time has almost completely obliterated traces of the andesite quarries that were the main sources of building stone (Caner-Saltık et al. 2007). In Old Ankara, andesite bedrock formed the foundations of the Citadel area, hence the quarries after use became part of the fabric of the city we see today.



Figure 17. Late Palaeolithic settlement remains in the Wadi Kubbaniya, Aswan West Bank, with grinding stone. Background: Late Palaeolithic grinding stone workshop situated in-between the low hills.



Figure 18. Late Palaeolithic grinding stone workshop, Wadi Kubbaniya, Aswan West Bank. Background: the settlement areas inside the Wadi Kubbaniya.

Statement of significance

The question remains as to how it would be possible to assign historical and informational values to quarry landscapes when there are no material remains at all? In the case of Ankara, historical value would be placed on how the use of resources reflects human agency over time, for example, how utilisation of the local resources characterise the fabric of the modern city, even down to colour. Arguably, this would be an expert value in terms of aesthetics. In addition, historical and informational values should also reflect ingenuity over past generations of builders who recognised ‘extinct’ quarry complexes as valuable foundations for the buildings we see today. As mentioned above, there may be some contradiction here in terms of placing ‘values’ onto destructive actions of historical remains, as would be expected in such circumstances. Yet, in Ankara, as opposed to places such as Sagalassos, there is perhaps a vision of what *may* have happened

to a quarry landscape (in a ‘*contact landscape*’ perspective) where consumption of a primary resource in close proximity to a city that was not abandoned.

Hence, we also have informational value in terms of how we compare cities of the past that were abandoned, with cities of today. In terms of scale, Ankara as a major capital is of global significance, but in terms of integration of quarry complexes into its fabric in a present-day cityscape then this is not unique, but nevertheless representative at a national level of importance. Moreover, we have to articulate that ‘lost’ quarry landscapes of the past make up far more of our modern cities and towns than realised, and in some instances their layout may be directly attributed to the extinct quarries they may lie on top of.

Concluding remarks

The objective of this paper has been to

review a methodology, developed during the QuarryScapes project, that can be used to identify the significance of ancient quarry landscapes to decision makers, heritage authorities and a wider public. It has looked at ways in which assigning historical and informational values, from an expert perspective, may be applied to ancient quarry landscapes and how developing a theoretical screen using ‘four concepts of landscape’ can aid in the articulation of significance. These concepts have been designed to assist visualisation of at worst the invisible, and at best, often confusing sets of material remains within their broader historical context. The information provided in a ‘statement of significance’ in relation to an ancient quarry landscape in terms of a scale of values, would then be integrated into other frameworks of value assessment.

These macro-level concepts of landscape allow us to take both a holistic view of an ancient quarry landscape and

also to 'best project' where historical and informational values may be attached to specific material remains within the landscape. Best projections being a planning tool used by decision makers when landscapes are under pressure from modern development. Yet, it is important to stress that the idea is *not* to 'squeeze' quarry complexes into just one type of macro-level assessment but rather, as the case studies demonstrate, deploy the concepts that are most relevant to the material remains that one may be dealing with (see Bloxam and Haldal 2008, p. 147, Table 36). Moreover, such macro-level perspectives can also help experts recognise historical and informational values in ways that may not have been previously realised and so enable a feedback mechanism onto the micro-level remains. In essence, a methodology for macro-level interpretation always needs to be reassessed and should be flexible if it aims to be transferable across the ranges of ancient quarry landscapes and their locations.

Some may argue that applying this methodology to put across historical and informational values 'glosses over' other key areas of significance of ancient quarries, particularly related to technologies. However, this view may miss the point when it comes to engaging the broader public in the debate as to why ancient quarry landscapes should be seen as an important cultural heritage. What this methodology can allow us to do is separate the scientific specifics of ancient quarries that are largely of interest to us, from the bigger story of significance that they may collectively convey. Moreover, comparative analysis of ancient quarry landscapes to assess a scale of values at local, national and international levels gives us the means to identify if global significance can be applied. Hence, the development and use of this method might assist not only in registering and protecting more of these landscapes as archaeological sites, but even help in some instances to build a case for World Heritage status.

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