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The Archaeology of Rock Art in Northern Africa

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Abstract and Keywords

The first reports on the rock art of north Africa were written in the mid-nineteenth century. Since then, rock art has become a key area of African archaeological research. Commencing with a short background on the environmental setting, this chapter reviews past research and major theoretical perspectives through to the present, highlighting contributions to wider debates. The main geographical, temporal, and archaeological frameworks of north African rock art are summarized in broad chronological order, beginning with late Pleistocene engravings up to ‘Camel art’ of more recent, historical age. Despite current hurdles faced in today’s research environment, rock art studies are of great importance in north Africa, especially when undertaken by African scholars. This precious, irreplaceable, nonrenewable cultural resource is of great educational value, and its preservation, teaching, and dissemination may contribute to a renewed awareness of the cultural value of rock art for future generations.

Keywords: North Africa; Sahara; climate change; Pleistocene hunters; early Holocene foragers; Holocene herders; desert peoples; landscapes; preservation; threats

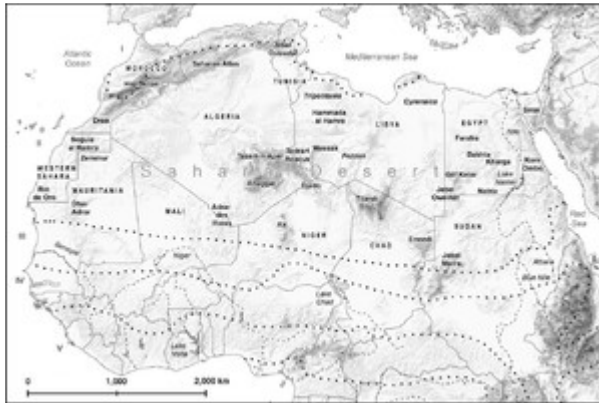
Introduction

There is general consensus globally on the importance of north African rock art, which in some cases—such as the Tassili-n-Ajjer in Algeria and the Tadrart Acacus in Libya—has been included in the UNESCO World Heritage list. According to some authors, however, archaeological research into past societies in northern Africa seems to have been scarcely influenced by current research practices on rock art, especially in the Sahara, which ‘has contributed virtually nothing to furthering our knowledge of rock art’ internationally (Chippindale, quoted in Keenan 2005: 484). Yet this strong statement

seems to be challenged by the quantity, richness, and diversity of contributions to rock art research in this area (see Smith 2013 for a recent commentary). According to Le Quellec (2008), perceptions of the poor relevance of north African contributions to world rock art research are mainly due to difficulties in accessing literary sources that are broadly scattered across a myriad of journals, websites, and coffee table books. Furthermore, much of this literature is in languages other than English, with many appearing in French, Spanish, Italian, German, and so forth. While all this may be true, I suggest an alternative explanation as to why north African rock art research appears to have been less influential for the study of rock art globally. In international perspective, the majority of recent rock art research seems to be characterized by ‘informed’ studies; that is, where continuity in the artistic production and/or the presence of an ethnographic background greatly improved our capacity to ‘break the code’ of parietal art (for ‘informed’ vs. ‘formal’ approaches to rock art research, see, e.g., Taçon & Chippindale 1998). The use of ethnographic data in rock art research applies particularly to southern Africa and Australia, for evident reasons (e.g., Layton 2001; Lewis-Williams 2002; Lewis-Williams & Pearce 2004). Given the chronological depth of north African rock art extending back to the late Pleistocene (Huyge et al. 2011), ‘formal’ scientific approaches have been favoured, these being less appealing in the present theoretical scenario than ‘informed’ methods and also often weakened by professional acrimony (Smith 2013). Nonetheless, marginality with respect to mainstream debates is not necessarily problematic (Conkey 2012).

In this chapter, I present evidence by which to better position the rock art of northern Africa in chronological and archaeological contexts. Given the immense geographical area at stake, the long chronological span, and the multiple facets of the associated archaeology, a summary of which is beyond the scope of this chapter, I focus on more specific issues relating to (1) environmental features; (2) a summary of previous studies; (3) geographical, temporal, and archaeological frameworks; and (4) research potentials and perspectives.

Geography, Climate, and Landscape Features



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Figure 1 North Africa, showing the location of major rock art localities. Dotted lines indicate the United Nation's African climate zones. Key: I: Mediterranean; II: Desert; III: Sahelian; IV: Tropical with Dry Season; V: Humid Tropical.

The region discussed here partially aligns with the United Nation's definition¹ of 'North Africa'. However, it is not restricted to northern Africa in its strict sense because it also includes Mauritania, Mali, Niger, and Chad, otherwise listed as 'Western' or 'Middle Africa' by the UN. The definition endorsed here of a geographically more encompassing north Africa is not uncommon in

archaeological and historical studies, which routinely include the southern side of the Sahara as a cultural component of the northern part of the continent. This broader area is one that is disproportionately affected by vagaries of climate change. Taken together, the geographical region referred to in this chapter thus incorporates roughly one-third of the African continent, stretching west to east from the Atlantic Ocean to the Red Sea, and north to south from the Mediterranean Sea to the Saharan-Sahelian interface (Figure 1). As with any geographic definition, however, the one adopted here should be viewed with some caution, especially with regards to its southern limit, where the transition zone between the Sahara and savannah landscapes to its south (an interface zone called 'Sahel') is culturally and climatically extremely variable.

Despite its vastness and highly diversified geological history, the geographical patterning of present-day climatic zones across north Africa is relatively straightforward.²

Mediterranean climatic conditions occur in the northwestern highlands and coastal areas of the Maghreb (Morocco and Algeria), including the Tunisian and Libyan (roughly to just east of Tripoli) coasts (Figure 1). Much of north Africa is geographically classified as 'desert', most obviously because of the vast Sahara Desert region, the largest hot arid zone on Earth. Simply referring to the area as 'desert', however, fails to convey the diversity of environmental conditions across north Africa, a very large region that contains landscape features such as, for example, the Maghreb Atlas, the Saharan massifs, the Egyptian oases, and the Nile Valley floodplain. In these diverse landscapes,

climate, vegetation, and topographic features can vary greatly from those of 'deserts', and their proper understanding can hence contribute significantly to a more nuanced view of the study region as a whole. It is not coincidental that north Africa's geographical characteristics, in particular its mountain systems where extraordinary rock art galleries are found, are of core relevance to rock art research across the region generally.

The interfaces among climate, landscape, and rock art are of pivotal importance to rock art research in north Africa. Not by chance, the first European travellers exploring the region and finding artworks on rock were astonished by the contrast between present-day arid landscapes and the portrayal of hippopotami, elephants, and crocodiles in the art. The depictions of such taxa indicated the presence of well-watered environments, yet the landscape indicated otherwise. With such depicted fauna in mind, it is probably not surprising to find that, since the mid-nineteenth century, notions of temporal patterning in the major artistic traditions have been guided by interpretations of past climate change and regional environmental variability.

Synthesis of Rock Art Studies in North Africa

Several papers review observations made of north Africa's rock art by Western explorers commencing in the mid-nineteenth century, as recently summarized by Ben Smith (2013). Coincident with the emergence of archaeological research as a discipline in the twentieth century, rock art studies rapidly expanded in north Africa so that there are now thousands of publications on the subject, in several languages. A comprehensive summary of rock art research undertaken in north Africa was provided in a report commissioned by the International Council on Monuments and Sites (ICOMOS 2007). This study had contributions by several renowned international rock art scholars, including Jean Clottes and Abdella Salih, among others. Updated and current information about rock art research in north Africa is also readily available on several websites (e.g., AARS.fr; Britishmuseum.org; Africanrockart.org; www.bradshawfoundation.com/africa).

Publications by previous researchers focusing on specific aspects of rock art research in north Africa need to be positioned in their historical contexts if they are to provide an accurate historical perspective of the research, especially that of the Saharan region where most research has taken place. Although in some ways an oversimplification, I suggest that past research can be best understood when divided into four chronological phases, with some possible overlaps: (1) early discoveries (c. 1850–1920); (2) first systematic research expeditions (c. 1920–70); (3) the emergence of modern rock art research (c. 1970–2000); and (4) north African rock art research today (c. 2000–15).

Here, I adhere to this chronological framework, although I also aim to offer a more nuanced view by discussing the emergence of theoretical perspectives in broader chronological contexts. One of my major aims here is to stimulate fresh debate about the role of geographical and temporal themes in the development and emergent perspectives of rock art research in north Africa.

Early Discoveries (c. 1850-1920)

There is a chronological gap lasting more than a century between the earliest European descriptions of rock art in southern and northern Africa. The earliest description of rock art in southern Africa came from Mozambique in 1721 (Smith 2013). But the earliest account of rock art in north Africa is not until 1847. It concerns engraved representations of animals and humans at Thyout and Moghar-et-Tathani in the Algerian Saharan Atlas mountain range (Smith 1968: 4). A few years later (1857-58), Heinrich Barth described engravings of what he called the 'Garamantian Apollo' (Figure 2) in the Messak plateaux in Libya. Following these early descriptions, new reports of rock art continued to emerge in the writings of European army officers, explorers, and adventurers (e.g., Aymard 1911; Duveyrier 1864; Flamand 1921; Jacquot 1912).



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Figure 2 Original drawing of the 'Garamantian Apollo'

(after Barth 1857: 210, with permission of the Heinrich Barth Institute).

Early expeditions by Europeans in northern Africa focussed on geographic, ethnographic, and cultural aspects of unknown regions, and rock art was afforded only cursory comment.

However, early observers also provided new visions of Africa, suggesting that rock art was of particular value in providing visual evidence of temporal and subregional environmental variability across north

Africa. In this context, the relationships among climate, environment, and rock art was born in this period.

First Systematic Expeditions (c. 1920-70)

Starting in the 1920s, at a time when there were many expeditions in northern Africa, rock art research became a proper, although still embryonic, scientific domain. These field explorations of the 1920s covered several areas that were to become recognized as hotspots of African rock art, such as the Rio de Oro, the western Sahara, the Atlas Mountains, the central Saharan massifs, and the Egyptian desert (e.g., Basch Almagro 1946; Di Caporiacco & Graziosi 1934; Frobenius 1925; Graziosi 1934; Monod 1938; Winkler 1938, 1939). Most often organized in the first instance for military purposes or for reasons of colonial governance, these expeditions introduced an extraordinary but still relatively unknown aspect of Africa's cultural heritage to international audiences. The limitations of colonial perspectives are well evident in these endeavours; for example, in the Pace-Caputo-Sergi expeditions to the Fezzan in southwestern Libya, where rock art was scarcely mentioned whilst observations were nonetheless reported (Pace, Sergi, & Caputo 1951). A certain colonialist approach is also apparent in expeditions carried out in Algeria and Libya by Henri Lhote (1958) and Fabrizio Mori (1956) respectively, after World War II. In the case of Henri Lhote, Keenan (2002) underlined the 'westernized' copies—sometimes totally 'fake'—of many Tassilian paintings. In addition, a 1956 rock art exhibition on the Algerian paintings at the Musée des Arts Décoratifs in Paris was conceived to express the French colonialist power and cultural supremacy just during the harshest phase of the Algerian war for independence (di Lernia 2008).

Many seminal books appeared in the years after World War II (e.g., Alimen 1954; Bailloud 1965; Breuil 1952; Graziosi 1942; Lhote 1958; Mori 1965), although these publications were often limited by theoretical perspectives that either suggested a Western and/or classical derivation for their artistic merits, or were couched in European colonial rhetoric. Along with theoretical limitations, rock art was often poorly recorded, and methodological caveats were frequently ignored (e.g., Gallinaro 2008).

We do, however, owe much to pioneering researchers of the post-World War II period. Although imbued with obvious colonial overtones, research undertaken in the 1940s to 1960s stands as testimony to passionate scientists working in remote areas who, when faced by logistical obstacles, undertook painstaking fieldwork that provided a foundation for future rock art research.

The Emergence of Modern Rock Art Research (c. 1970-2000)

Rock art research in north Africa emerged as a science-based discipline during the second half of the twentieth century, during a period when epistemological debates and

methodological developments transformed world archaeology. In addition, political and historical events transformed the way north African archaeology was perceived internationally and practiced regionally. During this period, rock art and archaeological research became affected by enormous changes such as, for example, independence in Algeria, the revolution in Libya, and new political agendas in the Western Sahara. Commencing in the 1970s, a new wave of 'Saharien' visitors travelling through many parts of north Africa led to numerous archaeological discoveries and independently carried out rock art surveys. These new discoveries revolutionized our knowledge of north African rock art, not only from a methodological point of view, but also by providing a large quantity of new and original data. There were, however, notable differences between archaeology projects carried out by major institutions and those undertaken by independent researchers, particularly with regard to their engagements with national hosting authorities. Future research programs would benefit by establishing closer working relationships between 'institutional' and 'independent' researchers.

Advances in rock art research during this phase are highlighted by spatial approaches such as those employed in the systematic surveys and site analyses of the Saharan Atlas Mountains (Hachid 1992); the Messak plateau in Libya (e.g., Jelinek 1985; Lutz & Lutz 1995; Van Albada & Van Albada 2000); the Jebel Oweinat and adjacent massifs at the junction of Egypt, the Sudan, and Libya (e.g., Zboray 2005); and the systematic work undertaken in the Adrar des Iforas in Mali (Dupuy 1991). Major theoretical advances are also apparent in taxonomic revisions made for artworks in the larger Sahara region (e.g., Muzzolini 1995), replacing classical definitions of style that had previously been applied. In addition, influential Africanist researchers, such as Augustin Holl and Andrew Smith, tried to change the dominant chronological paradigm by adopting innovative conceptual frameworks that were largely influenced by ethnography, archaeology, and genetics (Holl 2004; Smith 1993). An attempt to connect rock art evidence with ancient mythology has been argued by Le Quellec (2004), who has also contributed to constructions of rock art styles, chronologies, and cultural contexts of Saharan rock art (e.g., Le Quellec 1996). Furthermore, a semiotic approach has been followed by Karl Striedter (1983), and Fekri Hassan (1993) has suggested a grammatical perspective to decode artistic elements found in rock art.

Finally, rock art research at the close of the twentieth century witnessed an increase in multidisciplinary approaches, in particular those relating to rock varnish (Cremaschi 1996) and the 'direct' dating of petroglyphs and paintings (e.g., Huyge, Watchman, De Dapper, & Marchi 2001; Mori et al. 2006).

North Africa Rock Art Today (c. 2000-15)

Trends in north African rock art research have been particularly relevant to international debates in the years from 2000 to 2015. Here, I refer to some of the most influential research projects mainly focused on central and eastern Sahara.

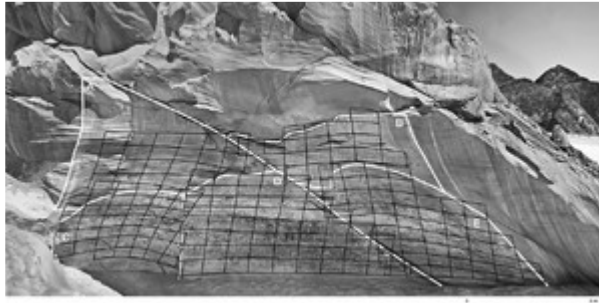
Surveys and excavations carried out in the Messak plateau (southwestern Libya) have produced the first contextual, chronological, and sociocultural assessment of pastoral Neolithic rock art for the region. In a case study associated with circular stone monuments with engraved representations of cattle and other animals, offerings of bulls have been securely radiocarbon dated to 5200–3800 cal BCE (di Lernia & Gallinaro 2010; di Lernia et al. 2013). Also in Libya, excavations of the stratified Holocene site of Takarkori, in the Tadrart Acacus Mountains, have revealed a long human occupation commencing with early Holocene foragers (locally called Late Acacus) and radiocarbon dated there to 8300–6100 cal BCE. This was followed by the presence of pastoral groups of distinct traditions whose sites date to 6400–3000 cal BCE. Here, the retrieval of hundreds of artefacts with traces of pigments has provided the basis for a multidisciplinary study of the *chaîne opératoire* of use through the early and middle Holocene (di Lernia et al. 2016).

Again in the central Sahara, but in the Algerian Tassili-n-Ajjer, an Algerian-French team led by Malika Hachid has systematically surveyed and sampled several locations with paintings and obtained optically stimulated luminescence (OSL) ages for sediments associated with the rock walls, thus providing a *termini post quem* of c. 9000–10,000 years ago for 'Round Head' style paintings (Mercier, Le Quellec, Hachid, Agsous, & Grenet 2012).

A successful dating campaign—long a thorny problem for the Saharan rock art—has been undertaken by Dirk Huyge and his associates at the Egyptian site of Qurta on the Kom Ombo Plain (Huyge et al. 2011). There, a beautiful panel with engraved aurochs partly covered by aeolian sand was securely dated by OSL to more than 15,000 years ago.

The beginning of the twenty-first century also saw a greater awareness of problems of preservation. This led to a twofold strategy to rock art research and the management of sites and rock art data: (1) a shift in the techniques used for recording sites, with a greater emphasis placed on creating digital repositories and data postprocessing; and (2) a more open approach to site management, with ongoing multidisciplinary studies carried out by joint institutions. An example of shifting approaches to site recording is the formidable work carried out by Rudolph Kuper and his team at Wadi Sura in the Gilf

Kebir of Egypt (Kuper 2013; Leisen, Krause, Riemer, Seidel, & Büttner 2013), where cutting-edge technologies have been used to digitally record the site (Figure 3).



Click to view larger

Figure 3 Cutting-edge technologies have been used to digitally record the site of Wadi Sura in Egypt

(after Leisen et al. 2013: 49, fig. 11.3, reproduced with permission).

The Messak Plateau in southwest Libya provides an example of management plan developments for rock art sites that includes geographical and archaeological contexts as well as preservation needs and sustainable site access. Following several calls to halt damage to sites caused by oil

prospecting in southwest Libya (Anag, Cremaschi, de Lernia, & Liverani 2002; Kröpelin 2002), an international panel of experts liaised with Libyan authorities to preserve in particular the Wadi Matkhandush art site in the central Messak (Biagetti et al. 2013; Gallinaro et al. 2012), being a hotspot of African rock art. Tragically, the conservation project abruptly ended at the beginning of the civil war in 2011. A management plan taking into account site significance, geographical information systems (GIS) analysis, and state-of-the-art conservation techniques has also been suggested for the Tadrart Acacus Mountains, a UNESCO World Heritage site in Libya (di Lernia & Gallinaro 2011). Another example of a significant rock art conservation project is the White Desert National Park north of Farafra oasis in Egypt, where conservation plans have been put in place thanks to a United Nations Development Programme-Egyptian-Italian cooperation project (www.egyptheritage.com/eco_rayan.html). In a further example of rock art site conservation from the early 2010s, UNESCO invited the Heinrich Barth Institute to coordinate the assessment of a trans-boundary heritage site including the Sudanese, Egyptian, and Libyan sides of Jebel Oweinat and surrounding areas (<http://whc.unesco.org/archive/2004-ouenat.pdf>).

Digital repositories used to manage rock art archives have become increasingly popular in recent years. A move toward digital repositories is commonplace these days, a trend that has been made possible by the expanding capacity of cloud-storing devices accessible at reasonable costs. At the same time, digital repositories provide improved access to web-based GIS systems, with incremental benefits for archival storage. Archival storage is of particular value in north Africa, where foreign institutions and independent researchers often fail to fully deliver documented research outcomes to host nations,

with, of course, notable exceptions. Examples include the African Rock Art Digital Archive at the University of Witwatersrand, Johannesburg (www.sarada.co.za), and the Rock Art Image Project of the British Museum (www.britishmuseum.org/research, thanks to collaboration with the Trust for African Rock Art (www.africanrockart.org)).

In the wake of the Arab Spring, rock art research and conservation measures are facing new challenges and increasing threats, not only from the iconoclastic fury against monuments and cultural heritage, but also from the growth of the illicit trafficking of archaeological objects. Given the vastness of the north African region, the difficulties of government control; porous international borders; and the social, economic, medical, and security threats faced by people in many north African countries, the future of rock art conservation is now more precarious than ever before (di Lernia 2015).

Spatial, Temporal, and Archaeological Frameworks of North African Rock Art

As briefly summarized earlier, rock art research in north Africa has strongly focussed on rock art chronologies that failed to engage with the social and cultural contexts of the art. Although chronologies remain fundamentally important to answering research questions, more nuanced approaches to the study of rock art have recently emerged.

Rock art is one part of the archaeological record. It is usually found on rock faces and is generally not transportable. Rock art often has a high visibility, it is relatively easily accessible, and may be revitalized through additions, modifications, and/or erasures. What rock art meant to people in the past, however, is irredeemably lost, and therefore a contextual archaeological approach is fundamental to building a cultural story for the art. This is especially so for north African rock art, where the cultural distance between present living traditions and those who made the art measures in the thousands of years—a time scale that cannot normally be bridged by so called ‘informed’, ethnographic approaches (with some possible exceptions, such as Dogon art in Mali: e.g., Le Quellec 2004).

The vastness of the north African region, the diversity of regional artistic traditions, and the long chronological time-depth hinder the construction of a regional synthesis. Hence, I will attempt to isolate here particular case studies that have wider regional significance, trying at the same time to build spatial, temporal, and archaeological frameworks for north African rock art. For the sake of simplicity, I shall follow a coarse-grained chronological order mostly aligning with and following Saharan research and nomenclature. I take this approach because of the richness of Saharan research and

because the methods that have been used are also appropriate for rock art research in other parts of north Africa.

Origins: Art of Hunters?

As briefly discussed earlier, contentious debates between supporters of long versus short chronologies affected the quality and originality of north African rock art studies. Not surprisingly, little room has been devoted to understanding the origins of rock art in north Africa, although some authors have emphasized the importance of either southwestern European (where Upper Palaeolithic rock art is well known) or southwestern Asian traditions (given the interconnections between Egypt and the Near East through time), even in the absence of definitive evidence to support their arguments (e.g., Graziosi 1942; Huyge et al. 2011; Jelinek 2004; Le Quellec 1998; Mori 1961; Smith 1968).

Recent research carried out at Qurta in Egypt investigates art panels with naturalistically engraved aurochs dating to the late Pleistocene at least 15,000 years ago (Figure 4). Huyge and his colleagues suggest possible relationships with the late Palaeolithic Ballanan-Silsilian archaeological phase, which may in turn imply a true age closer to 19,000–17,000 years ago. Qurta is not an isolated site, with other sites displaying comparable art traditions in the region. These in turn show stylistic similarities with art traditions of southwestern Europe, particularly late Magdalenian art (Huyge et al. 2011: 1190). Other potentially late Pleistocene rock art sites, although not securely dated, occur in the Fezzan and Cyrenaica regions of Libya (e.g., Pace 1934; Paradisi 1965; Marini, de Faucamberge, & Katab 2010; Mori 1974), as well as in the Sinai in Egypt (Zboray 2012b).



Click to view larger

Figure 4 Engravings of aurochs at Qurta in Egypt, dated to $\geq 15,000$ years ago. These artworks represent the oldest dated rock art in north Africa (panel QII.4.2, detail; photograph courtesy of Dirk Huyge).

The idea of a 'Mediterranean' tradition of Palaeolithic rock art is not new (Graziosi 1966), and new evidence from northeastern Africa might revitalize the idea. However, without necessarily advocating diffusionist explanations, one can speculate that late Pleistocene rock art represents material evidence for cultural interactions between social groups across north

Africa at that time. Such interactions could have been triggered by environmental variables and led to the emergence of a widespread African rock art tradition that later spread towards other environmentally favourable regions. If hyper-arid conditions during the late Pleistocene prevented any human occupation of the 'larger' Sahara Desert region until the reactivation of summer monsoons around 10,000 cal BCE, the same cannot be said of other areas of north Africa, such as the Maghreb, the Mediterranean coast, and its immediate hinterland, up to the Nile Valley (e.g., Cremaschi et al. 2014; de Menocal & Tierney 2012; Kuper & Kröpelin 2006). In these regions, more favourable environmental conditions during the late Pleistocene allowed a deep history of human occupation, although cultural transitions, social changes, and subsistence adjustments are still to be fully understood. Evidence of cultural interactions between southwestern Europe and northwestern Africa have been documented for the end of the Pleistocene (Barham & Mitchell 2008: 266; Linstädter, Eiwanger, Mikdad, & Weniger 2012; Linstädter, Medved, Solich, & Weniger 2012), and recent genetic data further support the notion of cultural interactions at that time (Pereira et al. 2010).

The naturalistic representations of aurochs from Qurta are chronologically much older and stylistically different from the engravings of supposed early Holocene age in the Sahara and north Africa (although some exceptions could be proposed). However, many authors have suggested the existence of a pre-Neolithic rock art tradition dating either to the late Pleistocene or early Holocene, as based on shared artistic subjects, the presence of rock varnish, and patterns of superimposition at engraved panels (e.g., Aumassip 1993; Mori 1965; Sansoni 1994; Van Albada & Van Albada 2000). This rock art tradition, known generally as 'Wild Fauna' or 'Bubaline', has been known and investigated for some time,

with earliest reference found in the first taxonomy of Theodore Monod and Henri Lhote. These works involve approaches that have since been challenged by some authors (e.g., Le Quellec 2013; Muzzolini 1992).

Recently, it has been suggested that environmental instability at the end of the Pleistocene may have led to higher levels of social risk, high population mobility, and migratory drifts towards unfamiliar environments. Some potential outcomes of this are the colonization of the Sahara at the very beginning of the Holocene by small groups of hunters moving southward from northern regions of the African continent (Cancellieri & di Lernia 2014). The dearth of secure dates for Bubaline artworks in coastal areas of north Africa and in the Sahara limits our ability to draw links between the rock art of these regions, as we have been able to for broader archaeological patterns. Nevertheless, the wealth of rock art produced in the Sahara from the early Holocene onwards could also have been related to the need by Late Stone Age newcomers to mark, inscribe, and memorize places, spaces, and resources.

In short, it is likely that environmental conditions after the Last Glacial Maximum led to increased territorial mobility among late Pleistocene hunters, facilitating interregional contacts and migratory pulses, as is suggested by archaeological and genetic data. Such migratory phenomena may also be reflected in shared rock art traditions. The engraved aurochs of Qurta, firmly dated to more than 15,000 years ago, are not isolated, with other sites containing similar features having been identified for the broader region. The engravings of Kaf Tahr and other contexts in the Jebel Akdar in Cyrenaica may well be considered expressions of late Pleistocene traditions. Yet, with a paucity of chronological data, potential interactions between people from different regions of north Africa are difficult to determine. Additional stylistic data and rigorous chronological information are necessary to test this working hypothesis, especially data from northwest Africa and inland Saharan regions.

Round Heads, Art of Foragers?

According to a recent review (Eiwanger & Hutterer 2004, cited in Le Quellec 2014: 158), the earliest painted rock art in north Africa comes from Ifri n'Ammar in Morocco. It is a rather schematic subject that is reddish in colour, covered by Iberomaurusian deposits, and roughly dated to the thirteenth to tenth millennia cal BCE. The excavators also found fragments of tortoise shell containing traces of pigment. Despite being highly schematic, the evidence from Ifri n'Ammar, together with Qurta in Egypt, conclusively disavows the idea of the existence of 'aniconic' hunter-gatherers (i.e., human groups without figurative parietal art) in the late Pleistocene and early Holocene of north Africa (Muzzolini 1995: 406). Indeed, a quite ahistorical concept, considering that already 50 years ago Philip

Smith (1968: 12) pointed to the existence of 'quite early art in North Africa', although different from parietal art. However, many authors already hypothesized the presence of early Holocene paintings, represented by the so-called Round Heads, which have been archaeologically associated with foraging groups. These fascinating and evocative artworks are characterized by anthropomorphic figures without facial features (eyes, nose, mouth, etc.): sex attributes also are very rare, leading some authors to speculate about the possible existence of cultural taboos prohibiting the representation of such body features (Sansoni 1993: 454). These anthropomorphic figures occur in several parts of the Sahara, with stylistic variations, and are particularly concentrated in the central massifs (e.g., Aumassip 1993; Breuil 1952; Lhote 1989; Mori 1965; Sansoni 1994; Soleihavoup 2007). A variation is apparent in which 'elongated' and other forms of Round Heads are reported from the eastern Sahara (e.g., Kuper 2013; Zboray 2005). Since the early systematic studies, Round Head paintings have been described as an autonomous cultural style (*sensu* Whitley 2011) and have been the subject of a considerable number of publications. According to some authors, based on there being very few representations of domestic cattle (Soleihavoup 2007: 157–158), Round Head paintings were the artistic production, or a 'school' of art, of early pastoral groups who should be dated to the end of the sixth millennium cal BCE (Le Quellec 2013: 19–20). However, recent research carried out in the Acacus suggests instead that there is a contextual link between Late Acacus foraging groups of the early Holocene and Round Head paintings in the Tadrart Acacus Mountains (di Lernia et al. 2016). OSL dating of sediments at some Tassilian sites in Algeria suggests an age for the production of Round Head paintings after 9000–10,000 years ago (Mercier et al. 2012).

Other than chronological issues, researchers have investigated topics such as gender divisions (Sansoni 1993), cognitive mechanisms (Mori 1998), stylistic evolution (Sansoni 1994; Soleihavoup 2007), and symbolic worlds and relations with animals (di Lernia 1999; Hachid 2014), as well as geographical distributions and landscape associations (Gallinaro *in press*). Yet despite a large volume and diversity of papers dealing with Round Head paintings, one still remains disappointed in the results. Such imagery remains poorly understood.

Cattle, Art of Herders

Much confusion in the past was due to the use of the French term *Bovidienne* or Bovidian (e.g., Lhote 1958; Monod 1938) to identify a gross art 'style' across north Africa containing depictions of domestic cattle. Fabrizio Mori (1965) preferred the use of *Pastorale* (Pastoral in English) because the term *Bovidienne* cannot literally be ascribed

to domestic animals only (but to the large Family of bovids, including their wild forms), whereas his *'Pastorale'* was strictly used to label food-producing, pastoralist groups.

The term 'Pastoral' encompasses a variety of meanings. Many authors have observed that such a label is too inclusive and generic (Muzzolini 1991). Furthermore, it cannot be indiscriminately applied to any north African region, and more specific stylistic indications that have regional value should be preferred (see ICOMOS 2007 for a regional synthesis). Despite artistic variability across much of north Africa, it is nevertheless the case that bodies of art focussed intensely on cattle reveal a widespread and deeply rooted cultural legacy (e.g., di Lernia 2012). The term 'Pastoral' may thus serve as a 'coarse label' to identify a long-standing and multifaceted regional tradition, yet still useful when asking questions of interregional variability. This is not just a matter of 'lumpers' versus 'splitters' (Smith 2013: 155), but rather of logical labelling and the capacity to understand what is going on with artistic choices across space and through time. In this scenario, while the so-called herders of Ti-n-Lalan in the Acacus Mountains of Libya are different from those of Aboniora in Algeria, for example, both are to be considered Pastoral—as much as the Winged Victory of Samothrace is different from the Dying Galatian, but both are labelled Hellenistic (*contra* Muzzolini 2001: 610).

One should remember that, archaeologically, we still struggle to isolate the fine internal subdivisions of Pastoral cultures. The Acacus and Messak regions of southwestern Libya and the Nabta region of southern Egypt are among the most studied regions of northern Africa, yet, even here, our relatively finest-grained internal archaeological cultural subdivisions of the Pastoral Neolithic last several centuries, if not a millennium.

Keeping the term 'Pastoral' as a coarse label rather than a true culture-historical style (see Whitley 2011: 72 for an instructive 'rule of thumb'), further efforts should be made to better understand regional variability in Pastoral art. Important contributions towards this come from Saharan contexts using a number of approaches: not only 'pure' stylistic dimensions of the art (e.g., Le Quellec 2010; Zboray 2012*a*), but also combining physical features of human subjects, associations between styles and classes of monuments, ethnographic analogies, and the presence of distinctive types of material culture, to name but a few (e.g., di Lernia & Gallinaro 2010; Dupuy 2007; Gauthier & Gauthier 2008; Holl 2004; Le Quellec 2013; Smith 2000; Soler Subils 2007).

From an archaeological and cultural perspective, however, several questions on Pastoral rock art remain to be resolved. In particular, the origins of the art itself remain unknown: is it endogenous, or did it come from further afield? How did artistic conventions diffuse across north Africa? How is Egyptian art related to Saharan art?

Much debate has been devoted to understanding the age of Pastoral art, which has generally been thought to equate with Pastoral Neolithic developments. However, assumed relationships between Pastoral art and pastoral groups remain unverified, given that, apart from a very few cases, there is a lack of strong correlation between the art and the broader archaeology for pastoralism (e.g., di Lernia & Gallinaro 2010). Not by chance, in the traditional perspective, the making of Pastoral art ends with the arrival of the horse, which, in turn, ceases with the introduction of the dromedary—another ‘fossil-guide’. In reality, however, there are overlaps, and cross-regional mixing and long-standing traditions make the picture quite complex. A typical example of such complexity is provided by the origins of the production of Pastoral art. There is no doubt that the assertion ‘no bovidian rock art can be earlier than the arrival of domestic animals’ (Le Quellec 2013) is true, but there may have been early pastoral peoples who did not make rock art. It is surprising that those who supported the existence of ‘aniconic’ early Holocene hunter-gatherers never claimed a similar possibility for the earliest pastoral groups but tried to equate the presence of early domesticates with early Pastoral rock art (Le Quellec 2013; Muzzolini 2001), recalling in some way the old statements by Obermaier (1931). In short, for both ‘lumpers’ and ‘splitters’ the first Pastoral art began with the first arrival of domestic cattle; hence, the duration of Pastoral art production should be closely aligned with archaeological evidence for the existence of pastoral groups, which probably lasted approximately five millennia, although no agreement is reached for the dating of its early stage.

According to his latest review, ‘nulle part au Sahara central on ne connaît de bovinés domestiques avant le cinquième millénaire’ (nowhere in central Sahara do we know of domesticated bovines prior to the fifth millennium) (Le Quellec 2013: 21). However, this suggested chronology is erroneous and due to a prejudiced interpretation of archaeological evidence from Tadrart Acacus and surrounding regions in Libya, where domestic cattle and ovicaprines from Takarkori (Biagetti & di Lernia 2013), as well as from Uan Muhuggiag (di Lernia 2013), are instead securely dated to the period from 6450 to 6250 cal BCE. However, as indicated earlier, an early date for domestic cattle does not necessarily imply an early date for the rock art. It is true that domestic cattle and sheep/goat entered northern Africa through multiple corridors from the east, including a potential maritime route to the Maghreb, from approximately the mid-seventh millennium cal BCE (see di Lernia 2013 for a recent review). If we look at southwestern Asian rock art, we struggle to find strong stylistic elements to support cultural relationships between many of the different artistic traditions found in that region. Yet research in the Near and Middle East has been irregular, and sound chronological assessments are still rare (Betts 2001). More recent reviews have not radically altered our understandings (e.g., Eisenberg-Degen & Rosen 2013; Khan 2013).

While it is true that artistic production across northern Africa (at least in coastal areas and in the Nile Valley) was in place since the late Pleistocene, it is also likely that cultural relations between hunter-gatherers and early herders influenced artistic traditions during the early Holocene. Encapsulation, acculturation, and integration processes among foragers and herders have rarely been investigated in north Africa yet would benefit by being considered of high priority. As alluded to earlier, analyses of the interface between Round Heads and Pastoral art is particularly promising, and some representations, such as those from the sites of Afa or Dobbobé in the Tadrart Acacus Mountains, could provide artistic evidence for complex acculturation processes (di Lernia 2012: 34).

In summary, Pastoral rock art provides an extraordinary corpus of evidence about early food-producing societies. Many studies have highlighted aspects of this artistic tradition, such as day-to-day domestic activities, symbolism, material culture, gender organization, and so on. The development of Pastoral rock art across millennia and over much of north Africa is difficult to interpret; even harder is the understanding of the relationships between local styles and regional archaeological contexts. Research in north Africa is uneven. and. in many areas. archaeological investigations have been limited, with most research focussed in the central Sahara. Areas in the northwestern section of north Africa are of equally high significance, although the northern highlands of the Western Sahara, Morocco, Algeria, Libya, and Tunisia are less well investigated (e.g., Ben Nasr 2003; Dupuy 2007; Hachid 2001; Soler Subils 2007). Thus, with a few exceptions (e.g., Barich 2014; Linstädter, Eiwanger, et al. 2012), regional archaeological patterns still remain unclear, and further research is needed. In the eastern Sahara, the situation is just as poor, given the scarce concordance of rock art hotspots and secure archaeological sequences, again with just a few exceptions (e.g., Huyge 2009; Ikram 2009; Riemer 2009, 2013).

Hierarchy and Interregional Contacts: The Art of Horse

There is limited academic agreement on the causes and mechanisms directing artistic change through time. If the transitions from foraging to food-producing strategies implied more pervasive sociocultural changes within human communities (given that strategies for obtaining food affect social organization, mobility, scheduling of social actions, access to places and territoriality, gender relations, the mobilization of age structures, fecundity, systems of signification and meaning, and so forth), and if those changing strategies were signalled in changing rock art conventions, it would be difficult to identify artistic changes without concomitant radical social transformations, such as from foraging to herding. However, at least in the Sahara, climate change has been presented as a powerful tool by which to shed light on sociocultural change, particularly given its strong

variations through the Holocene (e.g., Guagnin 2012; Le Quellec 2013). Another element is offered by the appearance within the art production of new elements, such as representations of the horse. The introduction of the horse into north Africa and the Sahara is seen in the rock art in a new form of graphic production: 'Horse art'. A similar association between the arrival of a new domesticated animal and the onset of new imagery also applies to the introduction of the camel (*Camelus dromedarius*): 'Camel art'.

After *circa* 3900 cal BCE, arid landscapes predominated across north Africa. Cultural trajectories became particularly diversified, with a strong trend toward increasing regionalism (e.g., Barich 2014; Brooks et al. 2005; Linstädter & Kroepelin 2004; MacDonald 2000). Many regions witnessed significant increases in degrees of territorial mobility, and year-round nomadism became more widespread (e.g., di Lernia 2002; Holl 1998). Food security became substantially based on maintaining small livestock, especially goat; cattle are rare in much of the Sahara desert area at that time, with these animals remaining confined to environmental refugia in mountainous regions and oases. Increased mobility, strong territoriality, and decreasing subsistence resources may have led to increasingly hierarchical societies. This is supported by the archaeological evidence, particularly that related to settlement organization and funerary practices, with the first ranked burials (Paris 1997; Sereno et al. 2008; Tafuri, Bentley, Manzi, & di Lernia 2006). The presence of nomadic elites during the latest phases of the Pastoral Neolithic signals significant societal changes largely driven by goods exchange and possibly trade within the Sahara-Sahel (e.g., di Lernia 2002; Holl 1998; MacDonald 1998), as well as increasing contacts between coastal north Africa and other Mediterranean regions. This in turn stimulated the dissemination of ideas and traditions across a broader landscape, or at least via increasingly fluid corridors of information exchange (Barich 2014; Linstädter, Medved, Solich, & Weniger 2012). One of the archaeological signatures of these new cultural and social connections is the presence of previously unavailable exotic goods—precious stones and minerals, although there are also others—mainly in funerary contexts and other symbolic settings (e.g., caches) across north Africa (e.g., di Lernia, Manzi, & Merighi 2002; Holl 2002; Kobusiewicz, Kabacinski, Schild, Irish, & Wendorf 2009).

We can expect such significant cultural changes to be somehow seen in the rock art. Material cognates between social change and rock art are evident in innovations in iconography, such as representations of what some authors define as dignitaries or aristocratic figures like the Ti-n-Lalan herders of the central Sahara (Smith 1993, 2000). According to Muzzolini (2001: 620), horses appear in other art schools, such as the Tazina, Ti-n-Anneouin, and Iheren-Tahilah artworks, with a preferential distribution occurring in the central Saharan massifs. The main stylistic traits of Horse production are an increase in the incidence of geometric shapes that regularly include two opposing

triangles (some authors use the term 'bi-triangular'), especially in human representations; the prevalence of red and white colours; and, on a thematic level, an increase in the number of scenes including armed human figures apparently fighting with long sticks and spears.

A regional variation in the Horse tradition is the presence of pecked engravings in the southern Sahara. These are said to represent so-called Libyan Warriors (e.g., Coulson 2007; Dupuy 1991; Haour 2003; Lhote 1972). The name 'Libyan Warriors' conveys the idea of social ranking, with the 'warriors' represented by men armed with spears and parts of their bodies exhibiting new kinds of styles and accoutrements, such as circular or mushroom-shaped heads and feathers in their hair.

Whereas artistic traditions such as the Ti-n-Anneouin herders appear to be regionally restricted, the so-called 'Tazina' style is widely distributed, having been identified from the High Atlas mountains in Morocco (where it was first identified) to the southern Sahara (Dupuy 2007; Muzzolini 2001; Salih 2007; Searight 2013; Soler Subils 2007). The distinctive and peculiar stylistic motifs of the Tazina style—above all the exaggerated, distorted fore and hind limbs of animals such as antelopes, caprines, bovines, and the like—allow for regional or interregional stylistic comparisons to be made, although chronological correlations remain problematic. Nevertheless, the widespread distribution of Tazina-style art suggests widespread influences and social contacts involving strongly nomadic pastoral peoples of the late Neolithic Pastoral phases. Archaeological signatures of such contacts, as suggested earlier, are found in funerary architecture and mortuary practices of the latest prehistoric period of north Africa (e.g., Brooks, Clarke, Garfi, & Pirie 2009; Paris 1997; Paris & Gaki 2010; Reygasse 1950; Tafuri et al. 2006). However, more research is needed to substantiate this hypothesis of such contacts.

Chronological correlations that can be used to better understand the age of the paintings and engravings of the general Horse style can be gleaned from archaeological evidence documenting the introduction of the horse in north Africa as well as from typological comparisons between material culture (mostly weapons) found both in rock art and excavated archaeological contexts.

However, there is no good agreement on the date of early introduction of the horse into north Africa because bones remain elusive in the archaeological assemblages. According to Clutton-Brock (1993: 65), the horse was introduced in Egypt by the Hyksos around the seventeenth century BCE. However, the pace of spread across north Africa remains poorly understood. Recent genetic research on horse bones from archaeological sites suggests possible contacts between north Africa and southwestern Europe, but dating is still uncertain (Lira et al. 2010).

An iconic theme within north African rock art is the horse-drawn chariot—the ‘flying gallop’—the distribution, meaning, and age of which have been repeatedly discussed (e.g., Lhote 1982; Mori 1965; Muzzolini 2001). Extrapolating from archaeological evidence that dates the earliest horse in north Africa to around the mid-second millennium BCE, some researchers have erroneously linked the introduction of the chariot to the introduction of the horse (e.g., Hansen 2001). As recently summarized by Le Quellec (2008), it is likely that chariot representations, especially the *quadrigas*, date to much later, possibly the first millennium BCE. However, inscriptions from the nineteenth and twentieth dynasties in Egypt confirm the presence of horses and wheeled vehicles among groups that presumably originated in Cyrenaica at a slightly earlier time (c. 1290–1070 BCE).

To sum up, Horse art encompasses several distinct traditions starting in latest prehistory and continuing into historical times. This is one instance where ancient labels, applied during early stages of research but without theoretical or archaeological substantiation, lack the kind of focus that is evident in, for example, Pastoral art and associated archaeology. The notion of Horse art should be replaced with new, more locally meaningful and contextually supported notions and labels.

Camel, Art of Desert Peoples

The appearance of engravings, peckings, and paintings depicting camels represents another major phase of northern Africa’s rock art. Beginning with the early periods of research, scholars have used the camel as a fossil-guide to identify a ‘Pre-Cameline art’ (to underline its antiquity and prehistoric milieu) as well as a ‘Cameline art’ known from the historic period. Archaeological evidence from Qasr Ibrim, close to Lake Nasser in Egypt, dates the introduction of the camel there to *circa* 740 cal BCE (Rowley-Conwy 1988), whereas camels were known in southeastern Arabia from *circa* 1000 cal BCE and in the Levant not before 1000 cal BCE (Magee 2014: 197–213), although Mario Liverani (2005: 452) suggests slightly earlier dates.

A parsimonious cutoff date for the spread of the camel across north Africa may therefore be placed in the mid-first millennium BCE, although marked regional variations are apparent. From a stylistic viewpoint, the increased schematism evident in Camel art reflects a kind of legacy from Horse art, as is particularly apparent in the presence of coarse bi-triangular human figures. In addition to camels, recurrent themes in Cameline art are oasis scenes, palm trees, water wells, orchards, and other aspects of day-to-day desert life.

Unfortunately, Cameline rock art has been rather neglected, if not disregarded (e.g., Mori 1965) by researchers, probably because it has often been adjudged to be crude and apparently less important than other artistic traditions. Yet this highly schematic, rough, and ubiquitous artistic expression offers important insights into the human occupation of desert locations in north Africa (Figure 5). Combined with the diffusion of Tifinagh writings (a Libyco-Berber script) across the Sahara, Cameline rock art contributes to understanding the exploitation of water sources and landforms in a dramatically altered Saharan environment (e.g., Biagetti, Ait Kaci, Mori, & di Lernia 2012; di Lernia 2012). In her recent review of Tadrart Acacus rock art, Gallinaro (2013) has introduced the term 'Modern Camel', which includes the artworks produced today along with subjects of recent items of material culture such as cars, guns, and the like.



Click to view larger

Figure 5 Ti-n-Taboraq, a rockshelter in the Tadrart Acacus of southwestern Libya. The site was vandalized in 2009. It contains a series of paintings of different styles, with a special emphasis on camels

(courtesy of Sapienza University of Rome).

Problems, Potentials, and Perspectives

Needless to say, the state of rock art research in north Africa has many issues that cannot be addressed here. There is no doubt that archaeological research in rock art hotspots needs to be encouraged. Among the most promising avenues of research is the growth of multidisciplinary investigations aimed at better understanding technical aspects of rock art production (e.g., Mol & Viles 2010), which is essential to improving knowledge, conservation, and site management. The reduced costs and increased portability of several analytical devices such as digital cameras and portable X-ray fluorescence (pXRF) analysers will encourage the use of nondestructive recording methods. The application of Raman spectroscopy and other methods directly on the rock art has now been successfully tested in the field (e.g., Tournié, Prinsloo, Paris, Colombari, & Smith 2011).

Nevertheless, innovative approaches together with rock art site recording programs need to be undertaken by African scholars. But for a few noteworthy exceptions, and for a variety of reasons, there is still an astonishing paucity of local rock art researchers in north Africa (Clottes 2007).

The present situation in the Mediterranean, where there is iconoclastic fury against monuments, shrines, and archaeological contexts, requires very particular management agendas. Here, UNESCO has a role to play, but any such agendas need to be developed and implemented via local organizations (di Lernia 2015). Improved training for archaeologists and rock art specialists is urgently required across north African institutions, all of which are strongly exposed to risks of religious fundamentalism. The archives of foreign institutions that worked for many years in north Africa need to be digitized and provided to the host countries; these could be made accessible by means of Web-based GIS portals and other variably open media. The sharing of knowledge about the significance of cultural heritage via social networks and the Internet may engender a new awareness about the value of rock art, especially among school-aged generations.

Before the 2011 'Arab Spring', rock art and cultural tourism in general were among the most important assets for many north African nations. However, cultural heritage tourism provided little economic benefit to local communities, and proper management plans involving stakeholders were rare. Hence, it is probably not coincidental that where rock art sites in Africa are generally listed by UNESCO mostly for their *cultural* criteria, in the north African Arab States 'the value of rock art sites has mostly been accompanied by the *natural* qualities of the sites' (emphasis added, Sanz 2012: 499). Such correlation between rock art and 'natural qualities' has been likely due to the prominent roles played by environmental agencies across these regions (mostly in relation to oil and gas exploration and development impacts). Furthermore, rock art sites are significantly underrepresented in the UNESCO World Heritage list, a situation that is particularly true for north Africa, where only two sites are listed, although many of north Africa's other rock art sites are worthy of World Heritage nomination but still in the Tentative Lists (Boccardi 2008).

To conclude, the threats to north African rock art are many and varied. Environmental, climatic, and anthropic agents are increasingly endangering precious, irreplaceable, and nonrenewable cultural resources. At the same time, rock art research has great value. Through its recognition, dissemination, and preservation, rock art could contribute to the creation of a new appreciation of cultural values and of the significance of cultural heritage in north Africa and beyond.

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Notes:

(¹) <http://millenniumindicators.un.org/unsd/methods/m49/m49regin.htm> (accessed July 2015). According to the UN, 'North Africa' consists of Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, and Western Sahara.

(²) See UN Africa's climate zone: <http://www.zonu.com/fullsize-en/2009-11-07-10911/Africa-climate-zones.html> (accessed July 2015).

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