

Preface

Modern Human Origins in North Africa

In September 2007, we hosted a conference at the Max Planck Institute for Evolutionary Anthropology (Leipzig, Germany) on modern human origins from a North African perspective. In doing so, we brought together scholars working on climate, chronology, archaeology, and physical anthropology. The goal was to have an integrated view of current research in a geographical area and time period of importance for questions concerning the origins of modern humans, both biologically and culturally, and their subsequent spread from Africa to the rest of the world.

Currently within Africa the rich sub-Saharan archaeological record is the best documented for this time period, particularly in South Africa. However, one of the weaknesses of the South African record is the relatively few fossil hominins these deposits have yielded. In contrast, the North African record, especially that of the western Maghreb, is quite rich. The North African record, however, as many of the chapters in this volume make clear, is flawed by early and poorly published excavations that produced datasets either riddled with too many questions of provenience or too incomplete and biased to answer the questions we have today. Fortunately, the situation has started to change, particularly in the last decade, and there are now a large number of ongoing projects at many of the classic North African sites. Work is especially active in the Moroccan cave sites, including Jebel Irhoud, Rhafas, Taforalt (Grotte des Pigeons), Dar es-Soltan I, El Mnarsa, El Harhoura, Contrebandiers, Ifri n’Ammar, and Mugharet el ‘Aliya. In Libya, Haua Fteah is now being re-excavated, and in Tunisia a program is underway to re-investigate the known sites and survey for new sites. In Algeria, new studies are being conducted at Bir-el-Ater, the eponymous site of the Aterian. These works have already forced a complete revision of the Aterian chronology, resulted in the discovery of significant new fossil material from well-documented archaeological contexts, and, more gradually, produced a better understanding of the lithic technologies and subsistence practices of these early modern humans.

Climate

Our view on the ancient peopling of Africa is biased by the current development of desertic areas, and of the Sahara in particular. The emphasis often put on the high genetic diversity of sub-Saharan populations should be put into perspective. Today the Sahara is virtually empty of human occupation but this was not always the case during the Pleistocene. As demonstrated in the contribution by Smith ([Chap. 3](#)),

the sedimentological and geochemical evidence suggest that it is only after 70 ka that humid events became less intense, although they were still significant. Marine sediment cores off the coast of North Africa (NW African margin and Alboran Sea) also provide indications of these climatic fluctuations during the late Middle and Late Pleistocene. The climatic pattern driven by monsoonal variations seems to be modulated after about 60–70 ka by the influence from high-latitude processes due to the lower amplitude of the precessional cycles. According to Moreno (Chap. 1), the data indicate an increase in Saharan wind intensity during the Dansgaard/Oeschger stadial periods and the Heinrich events. However, most of the Mousterian or Aterian sites mentioned or analyzed in this volume predate this period of increasing aridity, and their geographical distribution extends into areas that are today covered by desert. During Marine Isotope Stage (MIS) 5 in particular, large bodies of water sometimes covering tens of thousands of square km developed in the Sahara, allowing an intense human occupation and population exchange between the Maghreb and the rest of Africa. This period is crucial for the evolution of the modern populations involved in the last Out-of-Africa event and possibly for the emergence of modern behavior in Africa. According to Geraads (Chap. 4), although the first half of the Middle Pleistocene of northwestern Africa is characterized by open landscapes, some more humid and/or forested areas, likely inhabited by early *Homo sapiens*, are documented during the second half of this period. It is during the Late Pleistocene that an increase in aridity reduced the faunal diversity. However, it is still difficult to reject the permanent human occupancy of large parts of the area, at least at some elevation. As underlined by Larrasoana (Chap. 2), North Africa holds a key location in the gateway to Eurasia. Although in northeastern Africa the “green Sahara” periods broadly correlate with Acheulian and Mousterian archaeological sites, Aterian sites are linked to spring deposits and mountain areas during a prolonged arid period. This author suggests that environmental fluctuations controlled the exchanges with the Near East and that the burst of arid conditions after 70 ka might have driven some of the late Middle Stone Age populations of northeastern Africa “out of the desert” into Eurasia. In Chap. 11, Hawkins also links this shift from wetter to drier conditions in northeastern Africa to a shift from MSA to Aterian. In her view, the Aterian is an adaptation to drier conditions requiring greater mobility and better projectile technologies to increase the effectiveness of hunting.

Biology

A very rich fossil record documents human evolution throughout the Middle and Late Pleistocene in North Africa. The main questions surrounding the interpretation of this material relate to the first evidence of a modern morphology and to the continuity between late Middle Pleistocene populations and recent humans in the area. In Chap. 15, Bräuer supports a model of gradual emergence of *Homo sapiens* with different grades. When comparing the evolutionary processes in northern, eastern, and southern Africa, it is difficult to assess the distinct roles of the different regions in the emergence of modern populations. It is therefore suggested that interregional migration and/or gene flow during periods of a “green Sahara” might have led to complex patterns. Supporting previous studies on the Jebel Irhoud material, Harvati and Hublin (Chap. 12) confirm that the facial morphology observed on these late Middle Pleistocene hominins is close to that of early modern humans from the Near East. It also relates to later populations in the area associated with the Aterian assemblages at Dar es-Soltan II. In contrast, the later Ibero-Maurusian humans, post-dating the peak of the last glacial maximum, seem to be morphologically closer to European Upper Paleolithic populations. The culmination of aridity represented by MIS 2 likely resulted in the final isolation of the Maghreb

from the rest of Africa, with the development of more population exchanges around the Mediterranean Basin via the Levant. The Aterian hominins are of utmost importance as they likely immediately predated the last Out-of-Africa exodus at the origin of the modern peopling of Eurasia. Although it is difficult to argue for any direct connection between the hominins who inhabited the western Maghreb and the first modern Europeans, they might give us a good picture of the populations who lived between the Nile Valley and the Atlantic Coast between 100 and 50 ka. Hublin and collaborators ([Chap. 13](#)) used the dental evidence to show that although very robust and still displaying some primitive features, these populations can be related to other early modern humans in Africa and the Levant. Importantly, this material sheds new light on the interpretation of the very first modern humans known in western Eurasia. The Nazlet Khater 2 (Egypt) skeleton is dated to MIS 3 and represents a population much closer to the gate of Eurasia. Crevecoeur's analysis of this specimen ([Chap. 14](#)) reinforces the notion that the populations of this time period still retained several archaic features, notably in the face and mandible.

Archaeology

One of the themes arising from the conference and apparent in the chapters included here is Paleolithic nomenclature. It is unclear what we call or how we define some of the archaeological units that form the basis of the record for this time period. So, for instance, while there are a few researchers with strong opinions, there seems to be a large amount of uncertainty about what to call non-Aterian assemblages that post-date the Acheulian and pre-date the Iberomaurusian. For some these assemblages are Mousterian, for some they are Middle Paleolithic, and for others they are Middle Stone Age. The problem is that each of these terms carries with it certain implications. To call these assemblages Mousterian, or Moroccan Mousterian as suggested during the conference, links them to Europe and recalls the time when fossil hominins from North Africa were considered to be Neandertals. This nomenclature also reinforces the notion of the Sahara as a barrier that divides Africa with, in this case, a sub-Saharan Middle Stone Age versus a North African Mousterian. However, as discussed, it is clear that the Sahara was not a barrier during times relevant to the discussion.

Working with materials from the Western Desert of Egypt, Hawkins ([Chap. 11](#)) defines all Levallois based industries, including the Aterian, as Middle Stone Age. In [Chap. 9](#), Garcea addresses the terminology problem directly and argues strongly for keeping the North African materials integrated into the African nomenclature, thus favoring a Middle Stone Age attribution. Garcea makes the point that the continued use of European terms mainly stems from European research traditions in North Africa and even considers that it could be derogatory to continue using European terms to describe African assemblages. Essential to her argument too is the association of biological types with stone tool industries. Thus, Middle Paleolithic assemblages, including the Mousterian, were made by Neandertals, and Middle Stone Age assemblages, including all of those in North Africa, were made by modern humans. In contrast, while primarily concerned with the definition of the Aterian, Richter and collaborators ([Chap. 5](#)) call these industries Middle Paleolithic.

The question of how exactly the Aterian should be defined (Bouzouggar and Barton, [Chap. 7](#)) and the related question of whether there are interstratified examples of Aterian and [other] MSA assemblages (Aouadi-Abdeljaouad and Belhouchet, [Chap. 10](#); Richter et al., [Chap. 5](#)) remain problematic. Most cite Tixier's (1967) definition of the Aterian as a Mousterian industry with Levallois technology, including Levallois blades, a high frequency of faceted platforms, numerous side-scrapers, relatively abundant points,

and a high frequency of end scrapers often made on blades. The key item for the Aterian, however, is tanged pieces. Tixier's definition included the tenet that a noticeable proportion of the pieces, sometimes as much as 25%, included proximal tangs, often bifacially prepared. Finally, the Aterian is also characterized by some bifacial foliates.

Bouzouggar and Barton ([Chap. 7](#)) recall that earlier definitions of the Aterian also noted the existence of small discoidal and Levallois cores. They further discuss their presence in the Aterian of Contrebandiers, El 'Aliya, El Mnasra and El Harhoura. Small flake production is now well-documented from a variety of Lower and Middle Paleolithic contexts based on a number of technologies including small Levallois and single surface cores, truncated-faceted techniques, Kombewa, and simple flaked-flake techniques. In some cases, small flake production is a response to raw material constraints (either size or availability), while in others small flakes were desired end-products. Bouzouggar and Barton also wonder whether the small cores themselves could have been used as tools. The techniques of small flake production, the use of small flakes, and whether these exist throughout the Aterian are areas of research that deserve more attention.

It is clear that the presence of a tanged piece makes an assemblage Aterian. What is less clear is what to do with industries that post-date the Aterian, based on either absolute dates or interstratifications, and that lack typical Aterian elements. In this volume, for instance, two sites are reported where MSA assemblages overlie Aterian assemblages. First, at the Moroccan site of Ifri n'Ammar (Richter et al., [Chap. 5](#)), a deep sequence contains interstratified layers of Aterian and MSA/MP industries with the only difference between the two being the presence of tanged pieces and the percentage of notched pieces. Second, the recently excavated open-air Tunisian site of Aïn El-Guettar in the Mekkassy Basin contains a well-stratified Aterian level below a Middle Paleolithic horizon separated by 1.4 m of sterile deposit. Aouadi-Abdeljaouad and Belhouchet ([Chap. 10](#)) conclude that the Mousterian and the Aterian are contemporaneous cultural groups, while Richter and collaborators prefer to group both into a Middle Paleolithic that contains at least two variants, one with tanged pieces and the other without, without chronological significance.

Given how important tanged pieces are in defining Aterian assemblages, we need a better understanding of the prevalence of tanged pieces in Aterian assemblages in general, as well as of the functional role of the tang. With regard to the former, Bouzouggar and Barton ([Chap. 7](#)) show the percentage of tanged pieces varying between as low as 1.4% and as high as approximately 30% at Dar es-Soltan I, with the caveat that the latter is almost certainly elevated due to collection biases. These numbers, however, are relative to other tools in the assemblage. To better understand their prevalence, data are also needed on assemblage size, artifact densities, raw materials, and more difficult measures like site function or context (e.g., open-air versus shelter, proximity to quality raw materials, etc.). These kinds of data should appear in the coming years as the assemblages from new excavations are published.

With regard to the functional role of tanged pieces in Aterian assemblages, here again, relatively little is known. The presumption has been that tools are tanged to accommodate hafting and that tanged pointed pieces are evidence of stone-tipped spears used for hunting. The latter have been used to pull the Aterian into the African MSA with an emphasis on regional point traditions and, in part, to support the idea that more efficient hunting characterizes an emerging modern human behavioral package. There are certainly impressively symmetrical, well-made, tanged points that one could easily imagine as armatures, but this has yet to be convincingly demonstrated. In addition, use-wear studies to date provide alternative interpretations, and the underlying variability in tanged pieces paints a more complex picture. Garcea reviews this topic explicitly in [Chap. 9](#). She notes that tangs are present on a wide variety of pieces, including those that are retouched and unretouched and those that are pointed and non-pointed. This aspect

of tanged pieces is clear whenever one looks at a recently excavated or collected assemblage that does not suffer from collection bias. Garcea also argues that the stem portion of the tanged pieces in her studied assemblage was too short to have provided an effective haft for a projectile and that the tangs themselves show use-wear patterns indicative of scraping activities and not of hafting. In [Chap. 7](#), Bouzouggar and Barton review data which show that tanged pieces were rarely used as projectiles and instead find evidence for working hard and soft materials and for cutting activities even when the piece has a pointed morphology. Garcea is careful not to exclude the possibility that some tanged pieces were in fact hafted, and evidence that tanged pieces were used for cutting or scraping does not exclude the possibility that they were hafted. Still, it seems that until evidence can be presented in support of Aterian points as armatures and even in support of hafting, we should remain cautious in our interpretation of the behavioral significance of the tang technique. Here again, we should expect more data soon on factors such as the technology of blank production for tanged pieces, blank selection for tanged pieces, retouch on tanged pieces, and the relative frequencies of techniques such as basal thinning in the assemblage.

At the same time, however, while the Aterian's distinctive tanged pieces can be used to recognize a techno-complex that extends over much of what is today arid North Africa, it is also clear that there is considerable regional and likely chronological variability within the Aterian such that we should not expect to be able to generalize findings from one set of sites to the whole of the Aterian.

Chronology

Raynal and Occhietti ([Chap. 6](#)) and Richter et al. ([Chap. 5](#)) tackle chronological issues. Since the application of ESR, TL, and OSL methods to North Africa, it has become clear that the Aterian is older than previously supposed based on radiocarbon dates and chronostratigraphy. The question now is just how old the Aterian is. Along the Atlantic littoral zone south of Rabat a number of Aterian deposits have now been dated and shown to extend to the last interglacial MIS 5e. This finding is supported by Raynal and Occhietti with the additional technique of amino acid analysis. To find older Aterian one has to look elsewhere, as the basal deposits in these cave sites were formed by the high beach stands of MIS 5e. Thus, it is perhaps not surprising that still older Aterian has recently been announced from the site of Ifri n'Ammar (Richter et al., [Chap. 5](#)). The oldest Aterian at this site has been dated to 145 ± 9 ka based on thermoluminescence dating of 9 heated lithics. It remains to be seen how much older both the Aterian and the preceding MSA/MP will go or whether additional, equally old Aterian sites will be found. On the other hand there are now relatively few sites, especially in the Maghreb, with late dates, and there may be a gap between the final Aterian and the Ibero-Maurusian in these locations (Garcea, [Chap. 9](#)).

Subsistence

One potentially important avenue to more fully explore is diet, especially considering the location of several of the better known Aterian sites that are currently being investigated along the coast south of Rabat where marine resource consumption is a possibility. As Steele notes in [Chap. 8](#), debates over the effectiveness of MSA hunting strategies, and more recently the role of marine resources in the diet have figured prominently in discussions concerning the origins of modern human behavior. These debates have

resulted in an emphasis on zooarchaeological studies. For North Africa, however, zooarchaeological studies have lagged behind, but this is changing. As in South Africa, there are numerous North African cave sites, especially in northwestern Africa, with good faunal preservation, being studied with a growing concern for identifying dietary changes. Until recently, most reports have emphasized the paleoenvironmental or chronological value of fauna and listed only the presence or absence of species. Despite numerous coastal sites, evidence for Aterian consumption of marine resources is still slim. In Morocco, coastal sites such as Dar es-Soltan I, El Harhoura I, and Murgharet el 'Aliya show the presence of several species of fish and of marine molluscs, and at Murgharet el 'Aliya, monk seal is also reported from the Aterian. This is the only marine mammal reported from a Late Pleistocene Moroccan assemblage (Steele, [Chap. 8](#)). However, the abundance and taphonomy of these occurrences are not yet well documented. Marine diets are easily detectable using stable isotope analysis, but to date there are no stable isotope studies on North African hominins. With current methods the problem will be poor collagen preservation in these relatively low latitude sites with high mean annual temperatures, and it remains to be seen whether this can be overcome. In the meantime, we should soon expect a series of more zooarchaeologically-oriented reports coming from the new excavations, and it will be especially interesting to get an evaluation of marine resources in the diet from the coastal sites south of Rabat currently under excavation.

Conclusion

The Middle to Late Pleistocene record has become the focus of intense research in large part driven by questions and debates surrounding the origins of modern human behavior and anatomy. Despite a long history of research in the area, North Africa has, until now, not featured prominently in these debates, with the focus instead being on East and particularly South Africa. The assessment of the North African evidence has suffered from two biases. One is related to the current geographical situation in which the Maghreb is separated from the rest of Africa by a major natural barrier representing the largest desertic surface of the planet. Although today the Maghreb is primarily connected to the Mediterranean Basin, this situation is relatively recent at the scale of the Pleistocene. It is only during the Late Pleistocene that the aridity in the region dramatically increased, although relatively “green” episodes are documented during MIS 5 and 3. It is therefore important to realize that exchanges of fauna and human populations were possible among North, East, and Central Africa until the eve of the last Out-of-Africa event, as documented by the large number of archaeological sites dating from this period in various parts of the Sahara. A second important bias results from the history of research conducted in the area. More than anywhere else in Africa, the studies in the Maghreb were conducted by European archaeologists who exported European models and developed the notions that “Neandertaloid” populations produced the “Middle Paleolithic” industries in the area. This is partly because this local “Mousterian” was by default considered to be roughly contemporary to the European Mousterian assemblages, and the Aterian was assumed to represent a sort of “transitional” assemblage chronologically centered on the European Middle/Upper Paleolithic boundary. One of the main advances in African archaeological studies has certainly been the reassessment of the chronology of these industries and of the antiquity of their makers. The North African paleoanthropological record is gradually being reconnected to the rest of the African record.

We suspect that another conference may be required a few years from now to help begin to incorporate and integrate this new work. In the meantime, however, what we have tried to do here is to take a kind of snapshot of where we are.

Reference

Tixier, J. (1967). Procédés d'analyse et questions de terminologie concernant l'étude des ensembles industriels du Paléolithique récent et de l'Épipaléolithique dans l'Afrique du Nord-Ouest. In W.W. Bishop & J.D. Clark (Eds.), *Background to evolution in Africa* (pp. 771–820). Chicago: University of Chicago Press.

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