

Chapter 1

General Introduction

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The origins of modern humans, and the fate of the Neandertals, are arguably the most compelling and contentious arenas in Paleoanthropological research today, and they have been at the forefront of the field for at least the past 20 years. The much-discussed split between advocates of a single, early emergence of anatomically modern humans in sub-Saharan Africa and supporters of various models of regional continuity represents only part of the picture. More interesting in our opinion are the relationships between anatomical and behavioral changes that occurred during the past 200,000 years. Although modern humans as a species may be defined in terms of their skeletal anatomy, it is their behavior, and the social and cognitive structures that support that behavior, which most clearly distinguish *Homo sapiens* from other animals and from earlier forms of humans. Moreover, it is the origin of our shared behavioral (rather than skeletal) characteristics that is of greatest interest to the rest of the social and behavioral sciences. Learning how humans, as a species, came to act the way they do is probably the greatest contribution that Paleoanthropology can make to understanding the human present.

Ideas about the paths of behavioral evolution have been, and in many cases continue to be, polarized along lines corresponding to the major positions on modern human origins (MHO). Many advocates of a replacement of archaic humans in Eurasia by expanding African populations support models of catastrophic behavioral change correlated with the origins (in Africa) or dispersal (into Eurasia) of anatomically modern groups. In Europe and western Asia, the Middle-to-Upper

Paleolithic transition has been taken to mark the end of anatomically and behaviorally archaic populations and the appearance of people modern in both body and mind. Not surprisingly, scholars that see a great deal more regional continuity in human biology favor models of behavioral gradualism, arguing that the roots of sophisticated behavior in the Upper Paleolithic were apparent much earlier and that the full range of Upper Paleolithic characteristics was actually slow to emerge, consolidating only in the later Upper Paleolithic.

Although they continue to drive the debate, especially in popular venues, extreme positions on MHO and accompanying behavioral change have become difficult to sustain as archaeological, paleontological and genetic data have accumulated. According to geneticists, a large number of extant genetic systems seem to have their roots in sub-Saharan Africa, but some genes appear to have older histories in other regions (Relethford 2001). Distributions of genetic systems once interpreted as evidence for rapid expansion of a small group of African moderns have been shown to be consistent with gradual diffusion of a small component of the human genome through existing human populations (Eswaran 2002). Similarly, it is now apparent that the earliest anatomically modern populations in both Africa and the Levant behaved in ways little different from their archaic forebears. Meanwhile, at least late Neandertals seem to have been capable of engaging in many of the technological and cultural pursuits once thought to distinguish behaviorally and anatomically modern Upper Paleolithic humans from all others (*e.g.*, d'Errico *et al.* 1998).

Among archaeological specialists, new models and new findings have resulted in a reframing of the basic problems. For researchers working in Africa, there has never been a question of whether or not there was genetic and cultural continuity between some population of indigenous archaic *Homo* and early modern humans. The major issue is now how and when major changes in behavior occurred, and how these relate to changes in anatomy. Some researchers (Klein 2000, 2001; Ambrose 2001) argue that major developments in human behavior occurred long after the appearance of an essentially modern anatomical configuration, in association with the sudden emergence of the organic capacity for language and symbolic cognition. Others (McBrearty and Brooks 2000; Henshilwood *et al.* 2000, 2001) assert that the package of traits thought to indicate modern behavior emerged gradually over a very long period beginning about 200,000 years ago, more-or-less in parallel with the biological development of *Homo sapiens*. Meanwhile, in Europe, objects such as bone tools and ornaments have been recovered from Châtelperronian layers at La Grotte du Renne (White 2001). The realization that this early Upper Paleolithic industry may have been the product of Neandertals has forced researchers to re-evaluate ideas about the behavioral capacities of anatomically archaic and modern members of the genus *Homo*.

Despite the rapid expansion of knowledge, three questions remain central to the brave new world of 21st century inquiry into the origins of modern humans. First, how different and distinct was the behavior of anatomically modern, Upper Paleolithic/Late Stone Age humans from that of their predecessors? What was really new about so-called "modern human behavior"? Second, how "difficult" an

evolutionary transition was this (Brantingham *et al.* 2004)? Did it involve a change in the fundamental behavioral capacities of hominins or simply a frequency shift in their behavioral tendencies? Finally of course, there is the historical trajectory of the transition in behavior. Did it occur quickly or gradually, and did different characteristics emerge in unison or piecemeal?

None of the questions outlined above is new. Researchers have been attempting to answer them, in whole or in part, for the past century. However, as debates over MHO and the significance of the transition from Middle to Upper Paleolithic have intensified over the past 30 years, some clear tendencies have emerged in how the questions are addressed. We believe that the framing of the questions in turn has important, if largely unintended consequences for the answers that people derive. The current volume, and the symposia that gave rise to it, were and are intended to provide fresh perspectives on these issues.

Researchers working in Eurasia tend to approach the question of MHO and the Middle-to-Upper Paleolithic transition in terms of general differences between the Middle and Upper Paleolithic, *sensu largo*. In some cases, they look more closely at the resemblance, or lack thereof, between the early Upper Paleolithic, the late Upper Paleolithic, and the Middle Paleolithic, again broadly defined. Lists of characteristics found in the two (or three) phases are compared, and the differences are interpreted in terms of the fundamental capacities or tendencies of the respective hominin populations. What is almost never addressed is what was going on earlier in the Middle Paleolithic, before modern humans and the Upper Paleolithic came on the scene. Researchers may consider what the terminal Middle Paleolithic was like, and whether there was evidence for disequilibrium just prior to the appearance of modern humans and/or the Upper Paleolithic. But the larger question of long-term evolutionary trends within the Middle Paleolithic seldom if ever arises. The Mousterian is treated as an essentially homogeneous unit, a set of variations on a narrowly defined theme, with little or no internal evolution.

In our view, there are three main reasons for this lack of attention to evolutionary change before the emergence of the Upper Paleolithic. One is the tendency to assume that there was nothing to pay attention to. The notion that the Middle Paleolithic (and quite possibly the Middle Stone Age) was essentially static and unchanging is a deeply entrenched one, repeated over and over in introductory texts and synthetic works. If the possibility of significant evolutionary dynamics is excluded *a priori* within the Middle Paleolithic, almost by definition truly important changes can only occur with its demise. As many of the contributors to this volume show, however, this account is too simplistic.

A second reason for the blindness with respect to Middle Paleolithic dynamics in Eurasia stems ultimately from fundamental ideas about the nature of human cultural evolution. A lasting legacy of early cultural evolutionist thought is the tendency to approach long-term trajectories of cultural change as accretive and progressive. Important intervals of change are marked by the addition of new cultural traits or forms of behavior to a relatively impoverished ancestral substrate. Because the appearance of novel characteristics is often used to define new stages or phases, change is recognized mainly as a transition from one state or taxonomic unit

to another. Regardless of one's biases with regard to the historical facts of MHO, we think this myopia with respect to possible evolutionary dynamics within the Middle Paleolithic is a serious handicap in attempts to explain behavioral transitions. First, it constrains one to approach all change as a transformational (if not catastrophic) event rather than part of long-term evolutionary process (Dunnell 1980). Second, the notion that cultural evolution occurs mainly by the addition of new traits implies that earlier stages are less developed and less diverse than later ones. This again tends to discourage the investigation of evolutionary dynamics within earlier cultural phases. Finally, the notion of cultural evolution as an additive process leads many researchers to ignore what is distinctive about the Middle Paleolithic, greatly handicapping any attempt to test notions of cultural continuity over time.

A third factor limiting our ability to investigate important biological and behavioral transitions is geographic discontinuity in scientific knowledge. Not without reason, researchers have tended to argue from one or two areas in which the archaeological and fossil record of the transitions is best documented, and to base their arguments on one or two classes of data. For a variety of reasons, accounts of biological and cultural changes leading up to the appearance of anatomically and behaviorally modern humans have been dominated by the European and Levantine evidence. But because modern humans are a single species, studying their origins requires a global perspective. Certainly there is a longer history of research and a substantially greater density of sites in western Eurasia than in Africa or East Asia, but this situation is nonetheless unacceptable as a solid basis for a more profound understanding of the historical process or processes at play. Evolutionary dynamics within the late Middle Paleolithic of southern France or the Mediterranean Levant, while interesting, cannot be generalized to other parts of Eurasia. A more satisfying and scientifically useful account of biological and cultural changes during the Upper Pleistocene must be extensive in its geographic coverage. If the same story does not seem to pertain to different areas, all the better: diversity of process is as significant as is the nature of the process in any one area.

The African record is crucial, irrespective of one's position on the biological and cultural transitions. A number of characteristics which in Eurasia are confined to the Upper Paleolithic—carved and polished bone tools, decorative motifs—appear precociously in sub-Saharan Africa (*e.g.*, McBrearty and Brooks 2000; Henshilwood *et al.* 2001), and it is difficult to dismiss the possibility that these are somehow linked to a similarly early appearance of modern anatomical features. Even if one is skeptical about these early finds, sub-Saharan Africa is the one place *everyone* agrees there was biological, and therefore at least some measure of cultural continuity. The African record therefore shows us at least one version of how behavior evolved in the context of general biological continuity. Eventually, it may also reveal which features of behavior were causally associated with evolutionarily derived characteristics of anatomically modern *Homo sapiens*, and which are only associated by historical accident. Thus, even if the African record does not explain the Eurasian one, it nonetheless is useful in understanding it.

We will never arrive at a satisfying account of why the Mousterian disappeared, and why Upper Paleolithic technologies and lifeways became so widespread so

rapidly after 45,000 years ago, without understanding why Middle Paleolithic adaptive patterns lasted so long. And we cannot hope to account for the durability of the Mousterian without understanding how, or if, they responded to changing conditions. The importance of the issue is not limited to advocates of a particular perspective on MHO. On one hand, if there is fundamental behavioral continuity between the Middle and Upper Paleolithic, it might best be seen as an extension of long-term trends. Otherwise, the existence of a period of unprecedented, explosive change at the end of the Middle Paleolithic, roughly coinciding with the appearance of modern humans in Eurasia, is too much of a coincidence to ignore. If, on the other hand, the spread of the Upper Paleolithic occurred as a result of a simple replacement, it behooves us to understand what was being replaced. Simple references to inherent superiority of modern-behaving, modern-looking humans are no longer adequate. What advantages did modern humans have over contemporary hominins and why did these result in rapid replacement in some places but much-delayed replacement in others? Understanding how earlier humans were, and were not, able to adjust their behavior is crucial to explaining what might have given modern *Homo sapiens* the upper hand. As for intermediate positions (sometimes known as “weak out-of-Africa” models), the timing of significant developments in behavior, or of deflections in the trajectories of change, is crucial.

The rationale for this volume, and for the symposia in which many of the papers were first presented during the 2002 SAA meetings in Denver, grows directly out of the problems just described. The book assembles researchers from Eurasia and Africa to discuss what was happening in the Middle Paleolithic and Middle Stone Age, prior to or during the appearance of anatomically modern humans. We asked the authors 1) to provide updates on the current state of knowledge about patterns of change over time in one or more categories of archaeological evidence within the MP and MSA and 2) to discuss the implications of such trends as could be identified for behavioral evolution later in the Pleistocene. The ultimate goal was to provide participants, and readers of the book, with the broadest and most current range of information available on the many transitions that might or might not have occurred before “The Transition.”

In organizing the original symposia we attempted to involve researchers from throughout Europe, west Asia, and Africa. A number of other researchers were invited to participate in the book project in order to even out geographic representation. For a wide variety of reasons, not all of the invitees were able to participate and/or to produce written papers, and unfortunately, a number of those who could not participate were responsible for dealing with regions relatively poorly known to many Anglophone researchers, including southern Africa and central Europe. We still feel that this volume offers a comparatively broad geographic perspective. One region that is not covered at all, however, is East Asia. We do not wish to give the impression that the area is unimportant. However, researchers in that part of the world are currently dealing with a range of problems very different from their colleagues who are working in Africa and western Eurasia. Even the basic taxonomic units Lower, Middle and Upper Paleolithic have very different

meanings in East Asia, and some scholars argue that they have little or no utility at all (Gao and Norton 2002). In light of the difficulties in comparing units and time periods, we felt that comparisons of trends and tendencies in the East and West would be best addressed in another context. Similarly, recent, hotly debated dates for early human arrival to Australia certainly have placed this continent in a time frame pertinent to the current discussion (O'Connell and Allen 1998; Stringer 1999; Bowler *et al.* 2003). We thought it appropriate to see the dust settle over this particular controversy before drawing the early archaeology of Australia into an already contentious discussion.

Several themes recur in the articles that make up this volume, as they did in the larger set of oral papers during the symposia. Not every author addressed all of these themes, but a synthetic reading of the papers reveals a number of common conclusions as well as problems for future study. We identify four principal topics: continental-scale difference in trajectories of change, the distinction between variability and directional evolutionary change, the potential consequences of demography, and the influence of terminology on research and thought.

One of the strongest patterns to emerge concerns differences in time-trends between the African and Eurasian records. Two of the contributors to this volume, McBrearty and Brooks, have already proposed that the African record shows a gradual and piecemeal development of various traits thought to indicate "behavioral modernity." This term itself is highly problematic and certainly deserves more careful scrutiny, but that's another volume. Not all African researchers see the data this way. The major proponent of a "catastrophic" model of behavioral change in the African Middle Stone Age, Richard Klein, was unable to contribute to this volume, though his view is well represented elsewhere (Klein 1995, 2000, 2002). The papers of McBrearty and Tyron and Brooks *et al.* here add more support for McBrearty and Brooks' earlier arguments. McBrearty and Tyron focus on the origins of the Middle Stone Age. Interestingly, for them the important transition occurs between the Acheulean and the Middle Stone Age, after which various manifestations of modern behavior occur throughout the Middle Stone Age. Similar to the later, more famous transition in Europe, the cultural changes are associated with *Homo sapiens*, in this case as a result of putative genetic events that led to the isolation of ancestral populations. Brooks *et al.* concentrate on the later Middle Stone Age. They argue that some of the most important developments concern projectile technology and the development of weaponry that can be used to kill at a distance. While this hypothesis requires further testing, it is provocative in that it identifies a behavioral/cultural characteristic, other than generic "modernity," that could have given *Homo sapiens* an advantage over contemporaneous hominins outside of Africa.

Virtually all of the contributors agree that the Eurasian Middle Paleolithic shows very different time trends compared with the African Middle Stone Age. That does not mean it is appropriate to describe the Mousterian as homogeneous and static: in fact, diversity and flexibility seem to be the operative themes here. Several of the papers (Delagnes and Meignen, Kuhn, Meignen *et al.*, Stiner, Marks and Chabai) document clear patterns of change over time in various local or regional

Middle Paleolithic sequences. What the papers also show, however, is that the trajectories of change in different regions were largely independent of one another, or at least that we are unable to identify the common themes. Moreover, trends within the Middle Paleolithic did not necessarily lead in the direction of the Upper Paleolithic. The Crimean evidence discussed by Marks and Chabai is a perfect illustration. In that area, Micoquian technology seems to have been remarkably stable whereas the Western Crimean Mousterian shows a distinct tendency towards the development of something like prismatic blade technology. And while prismatic blades are not essentially “modern” (Bar-Yosef and Kuhn 1999), they do represent the configuration lithic technological systems eventually took on in most places. The papers on France (Delagnes and Meignen) and the Levant, (Meignen *et al.*) also discuss distinctive patterns of evolutionary change within the Middle Paleolithic, neither of which shows a long-term trend towards Upper Paleolithic patterns, while the data from Italy (Kuhn) show different local trends, one seemingly “progressive” and the other not.

The contrasting trajectories of evolutionary change in the Middle Stone Age and Middle Paleolithic are not simply a matter of the Middle Stone Age being more dynamic or diverse. As McBrearty argues, it is not just change over time that marks the Middle Stone Age, but the accumulation of novel behavioral characteristics (“innovations”). In contrast, there is general agreement that the Eurasian Middle Paleolithic witnessed few if any novel behavioral developments. Much of what we know about Middle Paleolithic lithic technologies seems to represent refinements of very ancient techniques (Levallois, prismatic blade production, discoid core reduction).

Of course, not everyone agrees even that the Mousterian shows much in the way of time-transgressive tendencies. Monnier addresses the question of progressiveness in levels of artifact standardization during the Middle Paleolithic, and finds that expected “improvements” in tool-making cannot be documented, at least in France. Shea also emphasizes the relative constancy of later Levantine Mousterian technological and foraging patterns, although other researchers (Bar-Yosef, Meignen *et al.*) see much more robust chronological sequencing between what Shea treats as essentially contemporaneous patterns. Interestingly, faunal evidence from Eurasia (Gaudzinski, Stiner) shows few if any clear general trends, although there is considerable variation related to climate and local environmental characteristics. Middle Paleolithic hominins seem to have been successful large-game predators by 200,000 years ago, so effective at obtaining large hoofed animals in fact that they seldom resorted to intensive use of other animal resources. Somewhat less information is available concerning foraging patterns in the Middle Stone Age. Klein argues that Middle Stone Age foragers were able to take all but the largest and most dangerous animals (but see Milo 1998). Brooks points to the early appearance of fishing in southern Africa, 50,000 years before it became economically important in Eurasia. Evidence from site structure is even more equivocal. On the surface, the papers by Speth and Wadley suggest that Neandertals at Kebara 50,000 years ago organized their use of space in a more rigid manner than Middle Stone Age hominins (presumably *Homo sapiens*) only

30,000 years ago. However, both authors observe that evidence pertaining to the use of space is less easily interpreted than faunal or lithic evidence. First, there are simply too few cases to construct reliable time series. Second, expectations for how the use of space should be organized among behaviorally modern humans are not well defined, especially when different contexts, such as constrained and unconstrained spaces, must be taken into account.

In truth, the diversity of Middle Paleolithic behavior, and the apparent flexibility of Middle Paleolithic hominins, should come as no surprise. Mousterian hominins persisted for too long—upwards of 200,000 years—and in too wide a range of environments not to have been highly adaptable. Gaudzinski underlines an important problem with respect to interpreting this evidence: should the situational variability within the Middle Paleolithic be seen as evidence for sophisticated and highly responsive adaptive strategies, or should it be interpreted as simple expedience or opportunism? Answering the question hinges on the temporal scale of adaptive responses. It is necessary to understand how much of the diversity of Middle Paleolithic technological and foraging strategies was contained within the adaptive repertoire of a single population, as opposed to a series of rather more specialized solutions developed over millennia in response to specific local conditions. At present the temporal grain of most Paleolithic records simply does not permit us to answer this question, but it remains an important goal for future research.

A third major theme that cuts across data classes and regions is demography. Demography has a long and sometimes checkered history as an explanation for culture change, and some researchers may be dismayed to see it resurfacing here. On the other hand, Malthusian dynamics are central to the fundamental concept of evolution by natural selection, so it is entirely appropriate to consider population levels in addressing problems at evolutionary time scales. All of the authors who touch upon demographic issues agree that Middle Paleolithic hominins existed at very low population densities, lower in fact than any recently documented forager group (Hovers and Belfer-Cohen, Shea, Stiner; see also Gamble 1999; Kuhn and Stiner 2001). It is also widely held that localized population or lineage extinctions were common during the Middle Paleolithic. Due to the lesser densities of documented sites it is difficult to compare Africa and Eurasia directly. Geneticists do argue that sub-Saharan Africa has always had larger and more persistent populations than the temperate zones (Harpending *et al.* 1993; Relethford and Harpending 1995), although parts of the continent seem to have been abandoned during hyper-arid glacial intervals.

The possibility of major differences in population densities has important implications for phenomena ranging from prey choice (Stiner) to intergroup relationships and the propagation of cultural innovations (Hovers and Belfer-Cohen). If localized lineage extinction was as common as some authors argue (Hovers and Belfer-Cohen, Shea; see also Pennington 2001), then we also must consider the extent to which it structured the archaeological record. For example, how much of the appearance of diversity in the Middle Paleolithic is a result of cultural drift and eventual extinction of many small, isolated populations? It is also worth

considering the extent to which differences in population sizes and persistence might be responsible for the contrast between sub-Saharan Africa and northern Eurasia. Many of the apparent “precocious” developments of the Middle Stone Age, from fishing and the use of grinding equipment to the development of systems of ornamentation, could be linked at least indirectly to the sizes of local human populations. As Hovers and Belfer-Cohen point out, the propagation and persistence of cultural innovations also require continuity in systems of information transmission across time. Hypothetically at least, the size and stability of African hominin populations compared with Eurasian ones could explain why certain novel behaviors became established in the former area and failed to thrive in more sparsely populated parts of temperate and sub-Arctic Eurasia.

The final theme, taken up explicitly by Kleindienst and Clark and Riel-Salvatore but addressed in passing in many other papers, is the influence of terminology and systematics on the structure of research. It is certainly nothing new to argue that what we call things has profound consequences for how we study them, but in truth the question has not been adequately addressed by paleoanthropologists. The cyclical reclassification of the Neandertals as a separate species or as a subspecies of *Homo sapiens* is an obvious case in point, as it seems to have more to do with prevailing models for MHO than with changes in the available anatomical evidence. Clark and Riel-Salvatore’s paper addresses a wide range of generalizations about the Middle and Lower Paleolithic, arguing that these are often based on ambiguous, naive, and poorly-structured conventions of description, classification, and interpretation. Whether or not one agrees with Clark and Riel-Salvatore’s particular interpretations, the necessity for continuing critical assessment of epistemology is undeniable. Kleindienst, reflecting on archaeological terminology in North Africa, points out that the most common terminology imposes the impression of a development sequence, and that there is an inherent circularity in developing chronostratigraphic frameworks based in such systems. Interestingly, a terminological system based more strictly on geological criteria and assemblage composition developed more than 30 years ago by the main authorities in the region was never adopted.

In our view, if there is a single, overriding lesson to be drawn from the papers in this volume, it is that the eventual evolutionary successes of modern humans and the Upper Paleolithic were ultimately contingent phenomena. There is nothing preordained about the Upper Paleolithic. Earlier hominins in Eurasia were successful at colonizing a wide range of environments, and in some of these environments they managed to resist the expansion of modern humans and the Upper Paleolithic for many millennia. To one extent or another, they succeeded in maintaining stable (if small) populations under changing conditions by adjusting their behavior in response to those conditions. Yet while Middle Paleolithic behavior did evolve over the course of the Upper Pleistocene, it did not necessarily evolve towards what eventually became the Upper Paleolithic (see also Hovers 1997, in press). A model of cultural evolution as the progressive ascent of a single adaptive peak, with ourselves (as tellers of the story) at the summit simply does not apply. Mousterian hunters or toolmakers were not simply ineffective, incomplete versions

of later humans. Instead, the fitness landscapes (*sensu* Wright 1932; Palmer 1991) of the late Pleistocene were highly uneven or rugged, with many local peaks and valleys. The Neandertals and their contemporaries depended on successful strategies for coping with their circumstances. These strategies may have differed from those employed by later hominins, but they worked for a substantial period of time. The early appearance and subsequent disappearance of many “advanced” traits in sub-Saharan Africa may suggest that fitness landscapes in tropical Africa were similarly broken: sometimes generic Middle Stone Age technologies even had the advantage over the precocious Howiesons Poort (Ambrose and Lorenz 1990). It would benefit researchers to stop thinking about the appearance and spread of anatomically modern *Homo sapiens* and Upper Paleolithic technological adaptations as the final stage of a long, gradual climb towards modernity. Instead, we need to consider how these events altered the social and ecological arenas in which other contemporary hominins had been so successful, and in which the populations of modern humans themselves had to operate.

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