



THE EARLY UPPER PALEOLITHIC  
BEYOND WESTERN EUROPE

EDITED BY

P. JEFFREY BRANTINGHAM, STEVEN L. KUHN  
AND KRISTOPHER W. KERRY

The Early Upper  
Paleolithic beyond  
Western Europe



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## PREFACE

For students new to the study of modern human origins, it might come as a surprise to learn that only recently has there been any semblance of a consensus that the Mousterian—and the Middle Paleolithic more generally—is in some way definitive of archaic behavior. Indeed, prior to the mid-1980s, one rarely encountered strict distinctions between “archaic” and “modern” behavior, and archaeologists seldom sought to assign the Mousterian and Aurignacian to these mutually exclusive categories. Archaeologists in western Europe have long recognized spectacular changes in the material record across the Middle and Upper Paleolithic boundary beginning perhaps as early as 45,000 years ago, but the recasting of the Mousterian as distinctly “archaic” and the Aurignacian as distinctly “modern” has really only come to the forefront of archaeological debate since the publication of the landmark study of mitochondrial genetic lineages by Cann et al. (1987) and the subsequent ascendance of the “Out of Africa” model of modern human origins (Mellars and Stringer 1989). With a few notable exceptions (e.g., Clark and Lindly 1989; Clark 1999), the better part of the past seventeen years has been dedicated to aligning the newly designated “archaic” and “modern” industries of western European Middle-Upper Paleolithic sequence with the predictions of the Out of Africa model. Having done so, many archaeologists conclude—although not without controversy—that the Middle-Upper Paleolithic transition in western Europe represents a rapid replacement of archaic with modern behavioral systems and therefore provides broad confirmation of the Out of Africa model.

The western European Aurignacian has served as the holotype, or template, for the initial wave of changes that mark the beginning of the Upper Paleolithic (e.g., Mellars 1973). The Aurignacian provides ample evidence of

1. The typological and technological diversification of stone tools, especially blade-based tools;
2. The frequent manufacture and use of tools based on novel organic materials, such as antler, bone, and ivory;
3. Changes in subsistence pursuits, including both greater hunting specialization and the use of such new resources as aquatic foods;
4. The increasing complexity of intergroup social interaction, linked possibly to rising population densities; and, quintessentially,
5. The emergence of complex symbolic behavior, including personal ornamentation as well as portable and stationary art.

Despite its continued importance to structuring archaeological research questions and analytical approaches, however, it is far from proven that the Aurignacian is the most appropriate template for what “modern human behavior” should look like. This volume, above all, is about broadening our geographic perspectives to consider patterns of cultural change during the earliest phases of the Upper Paleolithic in regions located well beyond western Europe and the “heartland” of the Aurignacian. There is reason to wonder whether an independent test of the predictions of Out of Africa—or any other model for the origins of the Upper Paleolithic—against archeological sequences from regions outside western Europe would lead to the same conclusions as past syntheses. The dispersal of anatomically modern humans (or the spread of modern human anatomy) and the behavioral changes that occurred with the Upper Paleolithic are, by definition, global processes. As such, they must be understood from a broad geographic perspective. The western European archaeological record may dominate current views of these processes with respect to both the quantity and the quality of information, but the fact remains that western Europe is a relatively small area and a geographical cul-de-sac.

In adopting a broader geographical perspective on the earliest Upper Paleolithic, it is useful to emphasize that we all hold certain expectations about what cultural change should look like over this critical time period. When turning to regions beyond western Europe, it is reasonable to ask: Are patterns of cultural change fairly abrupt, similar to those represented in western Europe? Are the trajectories of cultural change locally unique and difficult to fit into a global sequence? Or do patterns of cultural change show some globally common patterns and some locally unique attributes? If the answer to the first question is yes, then the pattern is consistent with models of singular shift away from archaic patterns toward modern patterns of behavior. A positive answer to the second question, in contrast, is consistent with models of a mosaic of shifting behavioral adaptations based on local archaic behavioral systems. The third, of course, falls somewhere in between,

emphasizing the exogenous development of a modern behavioral package with the incorporation of local archaic behaviors.

Until very recently, there has been only limited opportunity to examine processes of behavioral change from the Middle to Upper Paleolithic outside the European centers of Paleolithic research. The most notable and earliest attempts focused on the Levant, another area with a long research history. However, the Levantine material record—especially the provocative evidence for continuity across the Middle-Upper Paleolithic boundary from sites such as Boker Tachtit—has continued to suffer under the impression that it represents only a minor exception to the dominant pattern of replacement identified in western Europe (Klein 1999). Without additional evidence from other regions, there is little hope of evaluating the validity of this assertion. After all, just because it is familiar to us does not mean that the record of western Europe is particularly representative.

This volume brings together some of the latest chronological, stratigraphic, and archaeological evidence concerning the earliest Upper Paleolithic from areas beyond western Europe. With the exceptions of the first and last chapters, the volume is organized geographically, beginning in central Europe and ending in eastern Eurasia. Chapter 1 develops several general conceptual tools for modeling evolutionary transitions and discusses how these may inform the study of the origins of modern human behavior and archaeological changes occurring with the transition from Middle to Upper Paleolithic. Chapters 2–6 consider the earliest Upper Paleolithic from central and eastern Europe, the Crimea, Ukraine, and the Russian Plain. Chapters 7–11 discuss recent archaeological studies in the Levant, Turkey, the Republic of Georgia, and central Asia. Finally, chapters 12–15 examine the earliest Upper Paleolithic from Siberia, Mongolia, and northwestern China. Chapter 16 summarizes and evaluates the evidence presented in the volume in terms of the conceptual models laid out in chapter 1.

This volume had its origins in a symposium at the 64th Annual Meeting of the Society of American Archaeology, held in Chicago, Illinois, 24–28 March 1999. We thank all of the authors for their timely and provocative contributions to the volume. The volume as a whole benefited from comments and critiques provided by Geoff Clark and an anonymous reviewer. We are particularly grateful to Blake Edgar at the University of California Press, who took a personal interest in seeing this volume to completion. Peter Strupp and Cyd Westmoreland at Princeton Editorial Associates proved invaluable in the final production process. Finally, we acknowledge the support of the various institutions that made this work possible, including the University of California, Los Angeles; the Santa Fe Institute; and the University of Arizona.



# On the Difficulty of the Middle-Upper Paleolithic Transitions

*P. J. Brantingham, S. L. Kuhn, and K. W. Kerry*

## BEHAVIORAL ADAPTATIONS AND HOMININ PHYLOGENY

The most recent Upper Paleolithic culture complexes differ in important ways from the latest Middle Paleolithic. Indeed, by 20,000–18,000 BP,<sup>1</sup> the height of the Last Glacial Maximum, many fundamental and unique features of modern human behavior—from the use of material culture as a medium of symbolic communication to the development of complex and costly technologies—are expressed on a global scale. The evolutionary roots of these behavioral characteristics may be much deeper, and, in a handful of places, they seem to be expressed precociously in time horizons considerably more ancient than the Last Glacial Maximum (McBrearty and Brooks 2000). Yet there is no consensus on where and when modern human behavior first appeared. More important, there is no consensus on what processes led to its emergence (Clark 1999).

The concept of the early Upper Paleolithic as a period distinct from both the late Middle Paleolithic and late Upper Paleolithic is intimately tied to these questions. The degree to which researchers emphasize the differences between the late Middle Paleolithic, early Upper Paleolithic, and late Upper Paleolithic is in part a function of where they work, but it is also connected with their views about the relationship between human behavioral and biological change. Much effort has been expended on characterizing the earlier of these transitions, between the late Middle and earliest Upper Paleolithic, in part because the earliest appearance of the Upper Paleolithic has long been associated with the origin and spread of anatomically modern humans. Supporters of models positing an abrupt replacement of indige-

1. Throughout the volume, all ages are reported in radiocarbon years before present (BP) or thousands of radiocarbon years before present (ka) unless otherwise noted.

nous archaic hominins (e.g., Neanderthals) by anatomically modern humans coming out of sub-Saharan Africa would like to see an abrupt archaeological break in the late Pleistocene archaeological sequence, perhaps coinciding with the appearance of the first Upper Paleolithic cultural complexes around 45,000 BP (e.g., Klein 1999; Mellars 1996, 1999). Supporters of models positing regional continuity in late Pleistocene cultural and biological evolution would like to see, in contrast, profound changes occurring only after anatomically modern humans evolved and became established across the globe, the behavioral transitions coinciding perhaps with the appearance of the late Upper Paleolithic around 20,000 BP (e.g., Strauss 1997). Neither of these expectations is particularly realistic.

The differences of interpretation stem in part from an insistence that behavioral evolution occurred in tandem with biological evolution. On the contrary, we see no necessary theoretical link between the transition from the Middle to the Upper Paleolithic and the biological origins of anatomically modern humans or, for that matter, the demise of archaic hominins. Nonhuman biological systems offer a wide range of examples where very complex behavioral transitions occurred repeatedly among unrelated taxa (see Camazine et al. 2001; Maynard Smith and Szathmáry 1995). Eusociality, for example, has evolved among sponge-dwelling shrimp (*Synalpheus* sp.) (Duffy et al. 2000), naked mole-rats (*Heterocephalus glaber*) (Sherman et al. 1991), termites (*Macrotermes* sp.) (Camazine et al. 2001) and bees and ants (Hymenoptera) (Wilson 1971)—within the last order at least a dozen times independently. Closer to home, the repeated independent origin of various complex stone core and tool technologies (Bar-Yosef and Kuhn 1999; Brantingham and Kuhn 2001), big- and small-game hunting (Stiner 2001, 2002), complex hunter-gatherer adaptations (Arnold 2001) and urbanism (Smith 2003) similarly do not diagnose biological transitions, and few anthropologists would argue that they do. What these examples illustrate is that, although phylogeny might be a good predictor of the probability that a particular behavioral feature might evolve, the opposite is not necessarily true: the presence of a specific behavior or behavioral system is not necessarily an accurate predictor of biological phylogeny. To wit, there is no more theoretical justification for saying that the Middle Paleolithic unequivocally diagnoses archaic hominins than there is for linking the Upper Paleolithic to the origins of anatomically modern humans.

Why continue to treat as problematic the relationship between the Middle and Upper Paleolithic if there is no necessary relationship between the evolution of “modern behavior” and the origin of modern humans? And why pay attention to the early Upper Paleolithic? We believe that it is precisely because of the potential for decoupling behavioral and biological evolution that the Middle-Upper Paleolithic transition is interesting. Indeed, the behavioral changes recognized within the early Upper Paleolithic sig-

nify a much more complex evolutionary process than is often imagined. Absent an assumed link between—or direct fossil evidence associating—individual hominin morphotypes and specific cultural complexes, anthropologists are forced to reevaluate their models for explaining the fundamental nature of behavioral change.

#### MODELING BEHAVIORAL TRANSITIONS

Use of the term “transition” to describe the emergence of the earliest Upper Paleolithic implies a jumping of significant evolutionary hurdles. There is little to dispute that imposing chemical, biological, and behavioral hurdles were jumped in the origins of self-replicating molecules, eukaryotic cells, and multicellular organisms (Maynard Smith and Szathmáry 1995; Michod 1999). These major evolutionary transitions were both difficult to achieve and astonishing precisely because of the hurdles that stood in their way. It is not immediately clear, in contrast, what evolutionary hurdles were jumped during the Middle-Upper Paleolithic transition. Although we agree that many of the features comprising the Upper Paleolithic are astonishing, this is no guarantee that the Middle-Upper Paleolithic transition was in some way evolutionarily difficult. The unprecedented developments of the Upper Paleolithic are no less impressive than the independent development of formalized systems of writing, mathematical notation, and logic among later cultures, but they need not have been enormously more difficult.

We believe that the most appropriate questions to ask at this juncture are: How “accessible” was the Upper Paleolithic, given what we know about Middle Paleolithic adaptations? Were Upper Paleolithic adaptations easily derived from many different starting points within the Middle Paleolithic, or only from a few discrete Middle Paleolithic variants? Was the Middle-Upper Paleolithic transition highly improbable, involving radical, unpredictable changes in the way that behavioral adaptations were organized? Or was the transition highly probable, involving small, predictable changes to existing adaptations?

The difficulty of an evolutionary transition is relatively straightforward to establish for genetic systems (Bärbel et al. 2001), and sometimes also for phenotypic systems (McGhee 1999). In such cases, metrics exist that provide reasonable measures of the distance between alternative states of the system. The distance between any two variants within a genotypic space, for example, is easily measured by the number of single base-pair mutations that it would take to transform one variant into the other. Thus, for a genetic string of length  $N = 1$ , the genotypic space consists of four alternative states (i.e., A, T, C, G) and it takes at most only one mutational step to get from any one variant to another. Assuming that mutation occurs at random—that there are no selective advantages to having any one genotype—it is clear that