

# 23 Cultural Evolution in Africa and Eurasia During the Middle and Late Pleistocene

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## **Abstract**

This chapter examines large-scale patterns of behavioral change that are often viewed as indicators for the advent of cultural modernity and developed symbolic communication. Using examples from Africa and Eurasia, the chapter reviews patterns of lithic and organic technology, subsistence, and settlement as potential indicators of modern behavior. These areas of research produce a mosaic picture of advanced technology and behavioral patterns that come and go during the late Middle and Late Pleistocene. Based on these data the emergence of modern behavior, as seen in the archeologically visible material record, appears to be gradual and heterogeneous in space and time. During the early part of the Late Pleistocene, personal ornaments in the form of sea shells are documented in southwestern Asia and southern Africa. By about 40 thousand years ago (ka), a diverse array of personal ornaments is documented across the Old World in association with Neanderthals and anatomically modern humans in Europe. These include both modified natural objects and fully formed ornaments. The timing and distribution of the appearance of figurative art and other classes of artifacts including musical instruments point to a more punctuated development of fully modern behavior during the middle of the Late Pleistocene, and certainly no later than 40 ka. Due perhaps in part to the long and intense history of research much, but by no means all, of the relevant data come from Europe. Early figurative art from the Aurignacian of southwestern Germany, northern Italy, Austria, and southern France provides undisputed evidence for fully developed symbolic communication and behavioral modernity. This chapter also discusses some of the hypotheses for the development and spread of cultural modernity and rejects a strict monogenetic model in favor of a pattern of highly variable, historically contingent, polygenetic development. This chapter highlights the need for new refutable, regional and superregional hypotheses for the advent and spread of behavioral modernity.

## 23.1 Introduction

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The question of when in the course of human evolution hominids became like ourselves has been at the center of several decades of productive debate in paleoanthropology. Reduced to the most fundamental level, the appearance of anatomical and behavioral modernity is a question of at what time in the course of evolution hominid anatomy and behavior fall within the variability documented in recent societies. The key component of fully modern cultural behavior is communication within a symbolically organized world and the ability to manipulate symbols in diverse social contexts.

This chapter will not address the development of modern human anatomy; here, I consider some of the key evidences for the evolution of complex behavioral systems. While there is no consensus about when modern behavior can first be identified in the archeological record, by no later than about 40 ka diverse finds documenting the production of ornaments, musical instruments, and figurative art provides undisputed evidence for cultural modernity. These and other archeologically visible indicators of cultural modernity point to a patchy development of complex cultural behavior and symbolic communication across the Old World. While some regional patterning is becoming visible (Delporte 1998; McBrearty and Brooks 2000; Bon 2002; Conard and Bolus 2003), the current data on this topic are generally a hodgepodge of evidence that has been put through a selective taphonomic filter and reflects diverse regional histories of research. These biases hinder the location of convincing centers of origin and dispersal for many of the key features considered here.

At present, we see diverse points of view regarding the origins of behavioral modernity, and current interpretations include but not limited to the following models are: (1) gradual African origin (McBrearty and Brooks 2000), (2) coastal origin in connection with new dietary patterns during the early Late Pleistocene (Parkington 2001), (3) punctuated late African origin (Klein 1999; Klein and Edgar 2002), (4) gradual origins across multiple human taxa and multiple continents (d'Errico et al. 2003), and (5) relatively late origins among multiple human taxa, including "*Neanderthals' own Upper Palaeolithic revolution*" (Zilhão 2001 p 54). Here, I argue for gradual polygenetic origins of behavioral modernity within a dynamic equilibrium between anatomically archaic and modern humans. The evolution toward behavioral modernity accelerated in the middle of the Late Pleistocene, and culturally modern behavior with diverse regional signals and local innovations, can be seen in many parts of Africa, Europe, Asia, and Australia between 30 and 40 ka. While archaic and modern humans must have interacted in many regions in the context of diverse social and ecological

settings, ultimately modern humans were at a demographic advantage in all regions and replaced archaic humans with relatively little interbreeding.

This chapter reviews some of the evidence for advanced cultural behavior and argues for a highly variable pattern of development depending on specific historical and evolutionary contingencies. The development of modern behavior does not in my view represent a one-time-only quantum leap, but a complex pattern of innovation, spread, and local extinction of new traits through cultural selection and social reproduction. Social, technological, and linguistic reproduction through learning are fostered by the biological success of the members of societies, but are not only driven by demographic growth. Demographic trends and complex patterns of intra- and intersocietal contacts led to mosaic patterns of cultural development that result from specific historical and ecological occurrences during the Pleistocene. The current archeological record provides glimpses of these evolutionary processes, but it would be naive to think that our current data on the fleeting material remains of the development and spread of behavioral modernity provide a one-to-one indication of where and when advanced technology, highly developed patterns of settlement and subsistence, ornaments, music, abstract and figurative representation evolved. The question of why fully modern cultural behavior evolved is still more difficult to answer, but recent years have begun to see attempts to address the thorny questions of causality (Klein 1999; Parkington 2001; Shennan 2001; Lewis-Williams 2002; Conard and Bolus 2003). Much more work is needed that addresses the potential causes of cultural evolution and develops testable hypotheses. In this context, monogenetic and polygenetic models need to be formulated and tested explicitly.

Turning to the more mundane aspects of archeology, it is necessary to stress the ambiguities and problems with dating sites in excess of 30,000 years. Radiocarbon dating, the strongest tool for dating LSA and Upper Paleolithic assemblages, begins to reach its limits in the period before 30 ka. Here, several factors come into play. In this period, in excess of five radiocarbon half-lives, contamination becomes a serious problem. The isolation of preserved collagen in bones and similar problems related to sample preparation become more problematic than in younger periods. Also, the physics of the AMS and beta counting become more challenging as minimal contamination begins to affect the results more strongly and the uncertainties related to the chemistry and instrument background become significant. Equally important is the wealth of evidence that there are major fluctuations in radiocarbon levels, probably in connection with variations in production due to magnetic excursions (Voelker et al. 2000; Beck et al. 2001; Conard and Bolus 2003; Hughen et al. 2004). These factors tend to make

radiocarbon measurements underestimate the calendar age of archeological materials in excess of 30,000 years.

Other methods, including luminescence dating, have great potential for sorting out the chronology of the emergence of modern human anatomy and behavior, but have yet to find broad application in addressing these issues. Fortunately, this situation is improving rapidly, and the prospects for gaining improved chronological control for the later stages of human evolution are excellent (Richter et al. 2000; Jacobs et al. 2003a, b).

This presentation will of necessity be brief and in no way attempts to be encyclopedic. Instead, I consider examples to illustrate the overall pattern of behavioral evolution. These examples are often drawn from regions where I have worked and know the data best. The subject matter is divided into two main sections. The first deals with the nuts and bolts of Paleolithic archeology and focuses on lithic and organic artifacts and patterns of subsistence and settlement. The second section deals more with data that provide more direct access to Paleolithic world of symbols, beliefs, and communication, and reviews evidence for burials, ornament, figurative, and non-figurative representation and music as means of defining modern cultural patterns. In general, the results from a review of the latter kinds of evidence give a better indication of the origins of behavioral modernity. My concern here is not in developing trait lists or single signatures for modernity, but rather to look at the evolutionary contexts of diverse classes of data that may help us to identify patterns of behavioral evolution. Other similar reviews of this evidence at different geographic scales can be found in a number of recent publications and should be consulted along with the primary references for further details (Deacon and Deacon 1999; Klein 1999; McBrearty and Brooks 2000; d'Errico 2003; d'Errico et al. 2003; Conard 2004a). Finally, many of the chapters in this volume present up-to-date information that is of central importance for defining the evolution of modern behavior.

## **23.2 Technology, settlement, and subsistence as measures of modernity**

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### **23.2.1 Lithic technology**

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Stone artifacts are a physically robust class of artifacts and often survive the numerous potential forms of taphonomic destruction. In this regard, they are a major source of data on early human behavior. In many Paleolithic settings, stone artifacts are the most abundant class of anthropogenically altered material. These attributes of lithic artifacts make them the most important means of defining

Paleolithic cultural groups. Thus, if specific lithic artifacts provided an indication of modern cultural behavior, scholars could use such finds as indicators of modernity.

Despite attempts to define linear or even cladistic systems for the evolution of stone tools (Foley 1987; Foley and Lahr 2003), lithic technology is based on learned behavior and is not directly transmitted biologically. Thus, it comes as little surprise that new forms of lithic technology come and go over the more than 2-million year old Paleolithic record. Oldowan technology is the most common form of flint knapping at the pyramids of Giza (Conard 2000), and this simplest of knapping approaches comes and goes throughout the Stone Age. Many other knapping technologies also come and go over the last several hundred thousands of years that are the backdrop for the development of anatomical and cultural modernity. Handaxes, Levallois technology, blade technology, and other elements of stone knapping come and go and do not provide certain indicators of modernity.

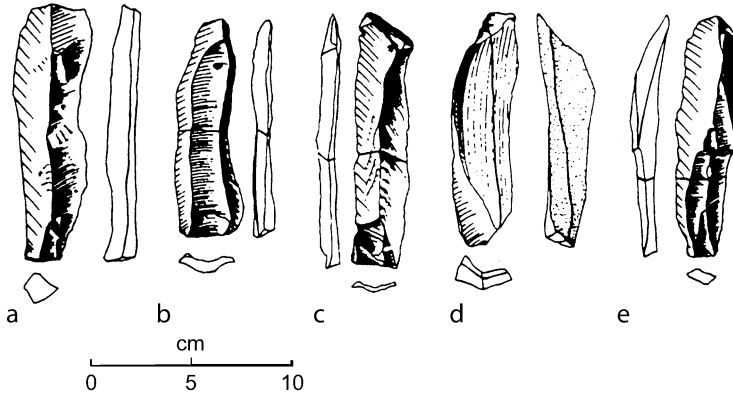
Additionally, the ethnographic record points to the problems associated with viewing lithic technology as a clear indicator of levels of cultural evolution. Subrecent ethnographic sources document cases of hunter-gatherers in regions including, for example, parts of Australia and Tierra del Fuego, who used Stone Age technologies that would leave no traces of behavioral modernity. These groups were undeniably modern humans and highly developed in respect to their linguistic skills and their ability to manipulate symbols, yet the lithic technology and the archeologically visible material culture would leave no traces of this modernity.

Lithic technology provides no simple solution to the problems related to identifying modernity. Even blades, which were once seen as clear indicators for behaviorally modern, Upper Paleolithic and Later Stone Age cultures have been demonstrated in diverse contexts in Africa, the Near East, and Europe (Rust 1950; McBurney 1967; Besançon et al. 1981; Singer and Wymer 1982; Conard 1990; Révillion 1994; McBrearty and Brooks 2000) (🔗 [Figure 23.1](#)). These blade-based assemblages date to the second half of the Middle Pleistocene and the Late Pleistocene, and include technologies based on Upper Paleolithic platform cores, non-Levallois and Levallois blade production.

Lithic assemblages document a heterogeneous pattern of development with forms coming and going across the Old World. While in Europe there is no doubt a difference between Middle and Upper Paleolithic assemblages, many forms typically associated with the Upper Paleolithic appear in earlier periods, and it is becoming increasingly clear that the variability documented by Bordes (1961) in the Middle Paleolithic of southwestern France reflects only a small portion of the overall lithic variability. Many regions of Europe (Bosinski 1967, 1982; Conard and Fischer 2000) show a diverse pattern of cultural development that

■ **Figure 23.1**

**Kapthurin Formation, Kenya. Late Middle Pleistocene baldes ca. 250,000 years old (after McBrearty and Brooks 2000)**



is analogous to that documented in Africa (Clark 1982, 1988; McBrearty and Brooks 2000). Also in the Near East, the early Middle Paleolithic includes lithic assemblages such as Yabrudian and Humallian, and the later Middle Paleolithic is characterized by Levalloisian assemblages that were made by both Neanderthals and anatomically modern humans (Shea 2003). The latter observation demonstrates how tenuous the link is between anatomical and cultural evolution.

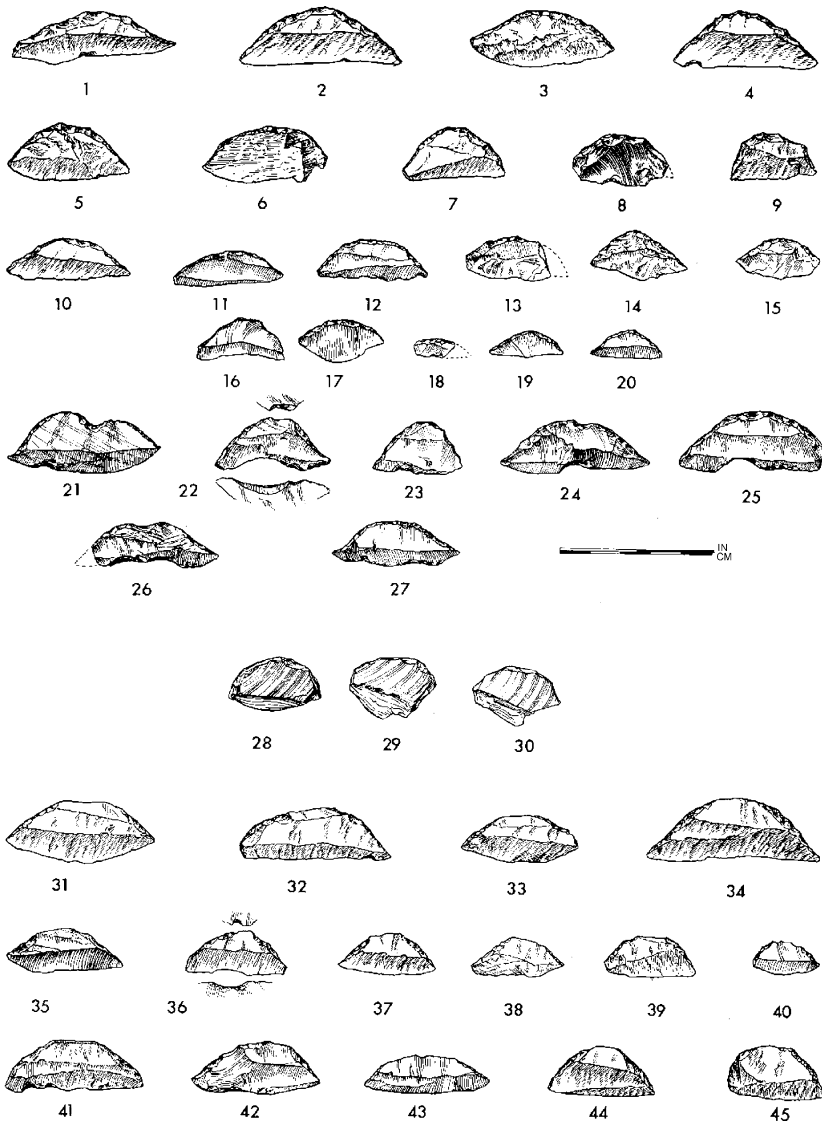
As Bosinski (1982), Clark (1982, 1988), and others have long pointed out, the MSA and Middle Paleolithic are marked by the growth and increased visibility of local traditions. The frequently made suggestion that lithic technology from these periods is static or even boring, strike me as incorrect. In many areas where high quality data are available, MSA and Middle Paleolithic assemblages show considerable diversity. The development of local traditions appears to increase with time in some areas of Africa and Eurasia (Bosinski 1967; Conard and Fischer 2000; Wadley 2001; Jöris 2002), but these trends are, to a certain extent, a reflection of the improved quality of data that results from both better chronological control and more numerous assemblages per unit time. Researchers who try to define variability must consider the quality and density of the available data. In general, early periods of the MSA and Middle Paleolithic have provided less data to address these questions than the later phases of these periods or the LSA or Upper Paleolithic. Thus it is not surprising that, in general, assemblages from more recent periods document more technological and typological variation than samples from earlier periods.

The complexity of Middle Paleolithic and MSA lithic technology is highly variable, but at times advanced. Hafting and composite tools have been documented

directly and indirectly in many regions. In Africa, we can consider the standardized-backed forms from Howiesons Poort assemblages to be strong candidates for hafting, as well as numerous point assemblages of the Upper Pleistocene and perhaps the Middle Pleistocene (Singer and Wymer 1982; McBrearty and Brooks 2000) (🔗 [Figure 23.2](#)). In southwestern Asia, Shea (1988, 1993, 1998) has long

■ **Figure 23.2**

**Klasies River Mouth, South Africa. Highly standardized lithic artifacts from the Howiesons Poort assemblage ca. 75,000 years old (after Singer and Wymer 1982)**



argued for hafting based on patterns of damage to artifacts and use wear. Mastic attached to Middle Paleolithic artifacts at Umm-el-Tlel in central Syria also demonstrates the use of hafting and provides evidence for composite tools (Boëda et al. 1998). In Europe, a similar pattern is present with small-backed artifacts that almost certainly required hafting being recovered at Tönchesberg (Conard 1992). European chipped stone points would have required hafting as on other continents, and mastic has been recovered, for example, at Middle Paleolithic sites of Königsau (Mania and Toepfer 1973) Neumark-Nord (Mania et al. 1990; Meller 2003) and Bocksteinschmiede (Wetzel and Bosinski 1969) in Germany.

Lithic assemblages of the MSA and Middle Paleolithic do not provide the evidence needed to define precisely when modern patterns of human behavior developed. They do, however, clearly show a heterogeneous pattern of technological development and transmission that does not indicate that the beginnings of the LSA and Upper Paleolithic saw fundamental revolutionary changes in technology across the Old World. This transition saw change and the further development of new technologies, but while more advanced forms of lithic technology came into broader use in the LSA and Upper Paleolithic, most of these technologies have well-documented precursors in earlier periods.

### 23.2.2 Organic technology

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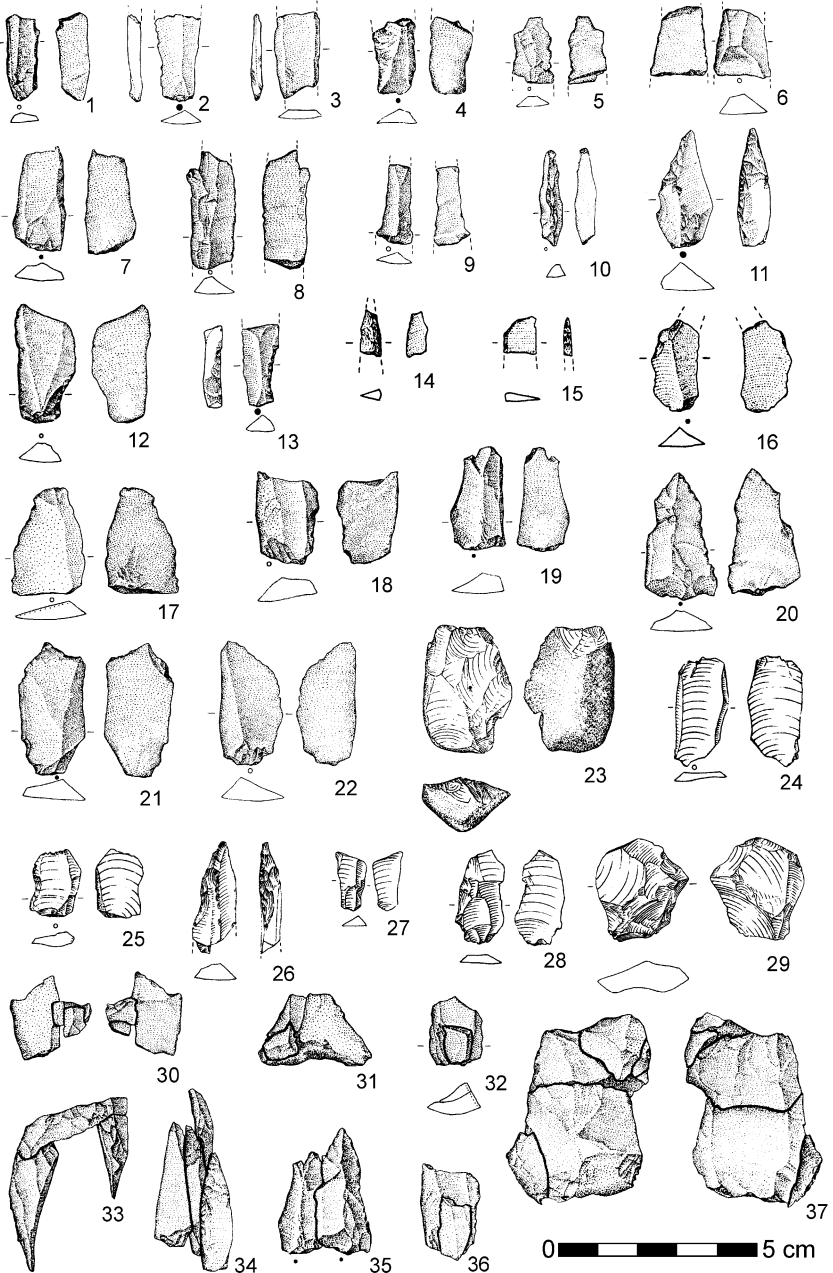
The development of organic technology shows a pattern analogous to that of lithic technology. While the LSA and Upper Paleolithic are defined on the basis of new artifact forms that occur in easily detectable numbers, organic artifacts have antecedents extending into the ESA and Lower Paleolithic. Thus the beginnings of the LSA and Upper Paleolithic reflect legitimate archeological divisions, but the changes represent a further elaboration and intensification of technologies that in some cases existed earlier.

In regard to this question, the most important discoveries of the last decade are the finds from Schöningen in northern Germany, where Thieme's excavations have yielded eight wooden spears and numerous other wooden tools (Thieme 1997, 1999) (🔗 [Figure 23.3](#)). These tools are of the highest workmanship and lend support to the importance of wooden tools from Clacton-on-Sea (Oakley et al. 1977) and Lehringen (Thieme and Veil 1985). Unless we postulate that this part of eastern Niedersachsen enjoyed a privileged position in human cultural evolution, we must conclude that organic technology and diverse well-made wooden tool assemblages were a part of daily life of the Lower and presumably Middle Paleolithic inhabitants of Europe. These sites provide a highly favorable setting for preservation that cannot be matched in other sedimentary settings, but



■ Figure 23.3

Tönchesberg 2B, Germany. Middle Paleolithic assemblage with blades, bladelets, backed points and backed bladelets and imported lithic materials ca. 100,000 years old (after Conard 1992)



occasional finds of preserved wood in Africa and the Near East leave room for optimism that future work may uncover comparable wooden artifacts.

Much has been made of the development and elaboration of bone, ivory and antler tools in recent years (Gaudzinski 1999; d'Errico 2003; d'Errico et al. 2003). MSA assemblages from sites including Apollo 11 (Vogelsang 1998), Klasies River (Singer and Wymer 1982), and Blombos (Henshilwood et al. 2001) have pro-

■ **Figure 23.4**  
Schöningen, Germany. Lower Paleolithic wooden spear and horse bones ca. 350,000 years old (photo N.J. Conard)



duced a wealth of bone artifacts (▶ [Figure 23.4](#)). Many examples are sharpened bones and bone splinters. Other bone tools show series of notches or more enigmatic forms. An exceptional case is the elaborately made harpoons from Katanda in D. R. Congo, former Zaire (Brooks et al. 1995); these finds would be remarkable if they were indeed of early Late Pleistocene age. Certainly, by the middle of the Late Pleistocene simple bone tools were widespread in the MSA.

The European Lower Paleolithic also documents early examples of bone tools including carefully manufactured handaxes (Segre and Ascenzi 1984; Gatti 1993). Similarly, bone tools are well documented at Middle Paleolithic sites, including Salzgitter-Lebenstedt (Gaudzinski 1999), Große Grotte (Wagner 1983), and Vogelherd (Riek 1934). Bone tools are by no means as common or complex as those of the Upper Paleolithic, but they no doubt existed in Middle Paleolithic assemblages. Bone tools were clearly used by late Neanderthals in many settings, and they have occasionally been documented in large numbers (d'Errico et al. 2003). These tools tend to be less standardized and less elaborate than the organic tools of the Aurignacian. Here, split base points, for example, are marker artifacts for the early Aurignacian over much of Europe (Albrecht et al. 1972; Hahn 1977). These standardized forms occur in Europe in significant numbers starting around 40 ka.

Finally, the Late Pleistocene sees further evidence for cultural innovations that should be mentioned here. These innovations include the widespread use of grinding technology during the MSA and Middle Paleolithic of northern Africa (Wendorf et al. 1993; Van Peer et al. 2004), evidence for fire-making technology in the Swabian Aurignacian (Riek 1934: 161; Weiner and Floss 2004), and water transport technology in the form of perforated ostrich eggshells (Vogelsang 1998; Parkington et al. 2005; but see Kandel 2004). As these and other less well-studied categories of finds and behavioral innovations become topics of more systematic research, they will play a more prominent roll in the discussions about the evolution of cultural modernity.

### 23.3 Subsistence

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Patterns of subsistence vary in time and space due to changing environmental conditions and changes in technology combined with changing social and settlement strategies. Although most sites do not contain preserved botanical remains, there is every reason to assume that plants played an important part in the diet of all hominids, just as they do for all ethnographically documented societies (Owen 2005). The diet of Neanderthals as reflected in stable isotope data indicates a relatively high component of animal resources (Bocherens et al. 1999, 2001), but these results do not preclude the use of plants in the diet and even in the harshest arctic and desert environments, plants are seasonally available and nutritionally important.

This is not the appropriate place to summarize the history of research on this question, but recent decades have seen a shift from assuming that archaic and early modern humans practiced fully developed systems of hunting and food sharing to a critical assessment and rejection of the earlier interpretations by many Anglophone colleagues. More recently, many case studies have provided

convincing evidence that both later archaic and anatomically modern humans practiced systematic hunting of large, medium, and small game. These data by no means suggest that patterns of subsistence are homogenous over whole continents or subcontinents, but the advocates of subsistence forms based on scavenging or ineffective forms of hunting (Binford 1989; Stiner 1990, 1994) seem to have overstated the case against the existence of reliable hunting economies within MSA and Middle Paleolithic societies (Marean and Kim 1998; Marean and Assefa 1999).

Again in this context, the finds from Schöningen are of central importance and have redefined the discourse on Lower Paleolithic subsistence. Thieme's (1997, 1999) team recovered eight spears from Schöningen in direct association with the bones of over a dozen horses in deposits dating to ca. 300ka. These discoveries from the mid-1990s brought the more extreme assessment of Lower and Middle Paleolithic subsistence based on obligate scavenging to an end, and as far as I am aware, the implications of these remarkable finds for documenting hunting of large game by archaic hominids and the implications of the recovery of a yew wood spear with the skeleton of an Eemian age forest elephant at Lehringen have not been questioned in recent years. These finds do not demonstrate that hunting large game was a universal phenomenon in the late Middle and Late Pleistocene, but they do document the existence of well-planned and successfully executed hunting of large and fast game.

More mundane sources of information tend to support this view. Numerous faunal assemblages indicate that late archaic and early modern humans had frequent early access to game. In most settings, the possibility of scavenging cannot be completely excluded, but active hunting is the most parsimonious explanation for the faunal assemblages at sites including, for example, Salzgitter-Lebenstedt (Gaudzinski and Roebroeks 2000), Tönchesberg (Conard 1992), and Wallertheim (Schmidtgen and Wagner 1929; Gaudzinski 1995; Conard and Prindiville 2000). In other contexts, in many parts of Eurasia and Africa, similar evidence for the role of mammals in the diet of Middle Paleolithic and MSA people has begun to accumulate (Gaudzinski 1996; Marean and Kim 1998; Marean and Assefa 1999; Burke 2000; Bocherens et al. 1991, 2001). Finally, it must be stressed that scavenging fresh carcasses is an attractive economic option in contemporary hunting and gathering societies (O'Connell et al. 1988). Thus there is no reason to stigmatize Paleolithic scavenging as a premodern adaptation.

In southern Africa, Klein and Parkington have developed new approaches and hypotheses for the development of subsistence practices during the MSA. Parkington (2001) stresses the key role of the exploitation of coastal resources for brain development and the origin of cultural modernity in coastal settings. He has also suggested that similar processes may have driven human evolution in other coastal environments, including the circum-Mediterranean region. Klein

(1999) has looked at small game such as tortoises and marine resources as playing an important role in MSA and LSA subsistence. He argues that until ca. 50 ka, hunting was limited to comparatively easily hunted game and that people only started systematically hunting dangerous animals, including suids and buffalo in the late MSA and LSA. Klein sees this shift in subsistence as an indication of the rise of cultural modernity in connection with genetic mutations and the appearance of fully developed language. Both Parkington's and Klein's hypotheses have been received with considerable skepticism, but both hypotheses present entirely welcome, refutable models for the rise of cultural modernity. Given the general lack of clearly formulated models that provide causal explanations for the rise of behavioral modernity, these hypotheses, even if they are later demonstrated to be incorrect, have fostered considerable new research. This is certainly the case of the critical assessment of the early evidence for hunting by Binford and colleagues in the 1980s and 1990s.

Like the other data we have considered thus far, the evidence on subsistence during the Middle and Upper Pleistocene shows a pattern of advanced adaptations at an early date. With the possible exception of Parkington's model for increased use of marine resources in the Late Pleistocene, the data on subsistence tend to argue against a revolutionary change in economic and social behavior that defines the appearance of cultural modernity.

## 23.4 Settlement

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Reconstructing patterns of settlement and the organization of space is one of the more elusive ways of trying to define modern patterns of behavior. This relates to the general difficulty of reconstructing settlement dynamics in any period and particular problems associated with Paleolithic periods, where the amount and quality of data are generally poorer than in later periods. The analysis of Paleolithic settlement in the contexts of defining modern behavioral forms has two major approaches, one intrasite the other regional.

Binford (1998), Wadley (2001), and others have argued that spatial organization within a find horizon can be used to define cultural modernity. Binford, for example, sees repetitive modular units of hearths and bedding areas in rock-shelters as a hallmark of modern spatial organization. In his view, this pattern of spatial organization is not present before the LSA or Upper Paleolithic. Wadley sees a marked increase in spatial organization during the late MSA of Rose Cottage Cave in the Free State of South Africa as a further indication that the final stages of the MSA may reflect the period in which cultural modernity developed.

In Europe, Kolen (1999) has pointed to the lack of clear evidence for architecture as an indication that neither Lower nor Middle Paleolithic groups regularly built shelters as centers of social and economic interaction, as are known in many later archeological periods. Instead, archaic humans used what Kolen refers to as “nests” to provide shelter. If correct, this would indicate that settlement dynamics of archaic humans, including Neanderthals, fell outside the range of culturally modern people. Several researchers have questioned this model and suggest that even if clear architectural features other than hearths are generally lacking before the Upper Paleolithic, late Middle Paleolithic sites document spatially structured activity areas similar to those one would expect in sites of modern hunters and gatherers (Vaquero et al. 2001, 2004; Conard 2001a). As with many of the criteria considered here, it is unclear to what extent taphonomic factors and the quality of data affect our interpretations. Kolen, however, is certainly correct to note that clear evidence for anthropogenic shelters and dwellings is extremely rare prior to the Upper Paleolithic.

At a larger scale of analysis, we see more tantalizing, yet largely inconclusive evidence for the use of space and distant resources as indicators of behavioral modernity. Important works by Geneste (1988), Roebroeks et al. (1988), Floss (1994), and others examine the use of distant raw materials as a source of information on Paleolithic economic and spatial organization. Especially in the context of the continental European approaches to the study of patterns of lithic reduction and technology (Geneste 1988; Hahn 1988; Boëda et al. 1990), much research has been aimed at linking patterns of lithic technology to systems of mobility and settlement. These and other studies show the nearly universal pattern that more distant raw materials are present at sites in more reduced form than local raw materials. This applies for all Paleolithic periods. In later periods more raw materials from distant sources are transported to sites, but there is no specific moment that reflects a quantum shift from non-modern to modern patterns of behavior. Also, the “provisioning of place” (Kuhn 1995)—that is, the movement of quantities of raw material to sites for future use—is documented on sites of both modern and archaic hominids (Conard and Adler 1997).

Examination of the abundance of distant raw materials as a reflection of the size of territories and long-distance economic and social relationships has also provided ambiguous results. Middle Paleolithic assemblages document the use of raw materials from 100 or more km away (Floss 1994; Féblot-Augustins 1997). Nonetheless, such long-distance transport of tools and raw materials are still more common in the Upper Paleolithic, and the difference is more one of degree than of kind. So far these kinds of data have not led researchers to devise a reliable means of distinguishing between archaic and modern behavioral forms. These lithic data also suggest mosaic, context-dependent systems of adaptations with

considerable variability, rather than a black-and-white world of unilinear evolution, in which quantum leaps between archaic and modern behavior can be readily identified.

Finally, an analysis of site types and links between sites within settlement systems shows considerable diversity in MSA and Middle Paleolithic systems of settlement, but no easily recognizable criterion for defining behavior modernity (Conard 2001b, 2004b). Here, as in other areas, I doubt whether the search for a holy grail of cultural modernity is a productive way of defining a research program. Scholars continue to struggle to identify the origins of a settlement system that reflects a symbolically mediated landscape inhabited by culturally modern people. Furthermore, if our definition of behavioral modernity includes all ethnographically documented patterns of settlement, we must concede that a nearly endless diversity of adaptations among subrecent hunters and gatherers is by definition modern and by no means easy to distinguish from hypothetical non-modern settlement dynamics as indicated by the distribution of archeologically visible material cultural remains.

## **23.5 Beyond technology, subsistence, and settlement**

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As the discussion above suggests, identifying clear criteria for behavioral modernity is probably more likely in the realms of ideology and symbolic communication than in the nuts and bolts archeology of chipped stone and faunal remains. Here, I consider several lines of argument and sets of data that lie outside the pragmatic economic concerns of day-to-day subsistence.

### **23.5.1 Burials**

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Most of the more complete human skeletons from before the Middle Paleolithic and Middle Stone Age appear to be the result of extraordinarily favorable taphonomic contexts. Despite arguments to the contrary by Gargett (1989, 1999) and other colleagues, there are a wealth of Middle Paleolithic human skeletons that seem to have been buried deliberately (Solecki 1971; Trinkaus 1983; Defleur 1993). Such burials could be motivated by purely practical factors like the need to dispose of undesirable cadavers, but I think it is more likely that the numerous burials of Neanderthals and anatomically modern humans of the Middle Paleolithic reflect the deliberate burial of kin and are linked to personal and emotional ties between the living and the dead. Defleur (1993) has summarized much of the evidence for Middle Paleolithic burials and points to a number of

convincing cases in Europe and the Levant. The question of the deliberate inclusion of grave goods and the identification of specific ritual practices is more contentious and difficult to demonstrate beyond doubt.

In the Upper Paleolithic the data are unambiguous, and many burials preserve opulent grave goods that reflect the status of the individuals and the needs of the dead in the afterlife. Examples of burials from Sungir', Dolní Věstonice, the Grimaldi Caves, and other sites suggest that the system of beliefs in association with death and the afterlife were much more elaborate in Upper Paleolithic than Middle Paleolithic societies. These Upper Paleolithic burials are universally accepted as indicators of cultural modernity. As far as I am aware, aside from somewhat enigmatic cases like the highly fragmented and partially burnt assemblage from Klasies River Mouth in South Africa, the MSA and early LSA have not produced sufficient data for burials to allow conclusions to be drawn about practices and beliefs in sub-Saharan Africa.

### 23.5.2 Pigments

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In recent years, there have been a number of reports of early occurrences of pigments and discussions of the importance and meaning of the use of pigments (Barham 1998; McBrearty and Brooks 2000; d'Errico and Soressi 2002; Hovers et al. 2003). On the basis of this work, it has become clear that pigments were used in some MSA contexts during the later Middle Pleistocene and in numerous MSA and Middle Paleolithic settings of the Late Pleistocene (Watts 1998). Southern Africa has yielded particularly abundant evidence for the use of pigments during the MSA. Barham's (1998) work at Twin Rivers in Zambia is a noteworthy example of the presence of many pieces of pigments in Middle Pleistocene contexts, and numerous MSA sites dating to the Late Pleistocene including Klasies River (Singer and Wymer 1982), Diepkloof, Peers Cave, Hollow Rock Shelter (Watts 2002), Apollo 11 (Vogelsang 1998), Blombos (Henshilwood et al. 2001) have produced much evidence for grinding of pigments. Parkington has argued that the use of pigments provides additional indications of the advent of behavioral modernity in the MSA, particularly in more coastal settings, where Howiesons Poort and Still Bay assemblages are concentrated. Watts (1998, 2002) has reviewed the evidence for the use of pigments in the MSA and concludes that they are extremely common at many MSA sites and reflect a widespread ability to structure the world into a symbolically organized whole. Watts rejects the hypothesis that pigments were primarily used for strictly utilitarian purposes, including tanning hides, while Wadley (2005) emphasizes the practical uses of ground ochre, for example, in hafting lithic artifacts.



In the Levant and Europe, Hovers et al. see strong evidence for the use of ochre at Middle Paleolithic sites including Qafzeh (Vandermeersch 1969; Hovers et al. 2003) and Pech de l'Azé (Bordes 1972; d'Errico and Soressi 2002). The potential uses of ground ochre include body painting, rock painting, drawing, ritual, medicinal, as well as more mundane purposes. Although we rarely have reliable information on the specific use of these early occurrences of ochre, they are presumably, at least in some settings, such as in Middle Paleolithic burials, connected with religious beliefs that speak for a high level of cultural development and a significant degree of symbolic communication (Hovers et al. 2003). As with other potential indicators of advanced cultural attributes discussed above, the use of ochre does not appear to reflect a quantum leap signifying the shift from archaic to modern patterns of behavior. Both anatomically modern and archaic humans used pigments and presumably attached symbolic meaning to red, black, and perhaps other ground mineral pigments. Given the well-documented use of mineral pigments, the use of organic pigments is likely, even if difficult to demonstrate with direct archeological observations.

### 23.5.3 Decorated objects and non-figurative representation

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There is a long history of claims for deliberate non-utilitarian modification of objects in Paleolithic contexts. These include finds from the Lower Paleolithic, such as incised bones from Bilzingsleben (Mania 1990; Steguweit 2003), and many finds from later periods. These objects are often controversial and are usually not accepted as demonstrating complex symbolic communication and cultural modernity. Following other lines of argument, colleagues have suggested that the perfect symmetry of some hand axes indicates an advanced aesthetic development, but Wynn (1995) and Haidle (2004) argue that hand axes do not necessarily reflect symbolically based communication or language. Over the course of the Middle Paleolithic and MSA, larger numbers of enigmatic objects have been published, including the cross-incised stone and modified fragment of a mammoth tooth from Tata, Hungary (Vértes 1964), and the so-called "mask" from La Roche-Cotard (Lorblanchet 1999). Some researchers have included evidence for collected fossils or curated natural products as indicators of advanced esthetic and behavioral patterns (Schäfer 1996).

Particularly in recent years, the MSA has produced a number of incised objects that have been taken as evidence for symbolic communication and a high degree of cultural development. Important examples of these finds include engraved linear and cross-hatched patterns on pieces of ochre from Still Bay

deposits at Blombos dating to ca. 75 ka (Henshilwood et al. 2002), and incised pieces of ochre from, for example, Peers Cave. Current excavations at Diepkloof have produced fragments of several decorated ostrich eggshells from Howiesons Poort contexts including a decorated piece of an ostrich eggshell flask (Parkington et al. 2005). Similar finds have also been recovered from MSA contexts at sites including Apollo 11 (Vogelsang 1998). These finds are unquestionably the result of deliberate manufacture and probably reflect the desire of the craftsperson to convey symbolic content and esthetically meaningful information to members of his or her social group. There can be little doubt that such carefully produced decorated objects and the non-figurative representations they carry communicated information from the maker to people who used or saw these objects. Deciphering the specific meaning broadcast through these finds is not easy, and few specific explanations for their meaning have been presented. With increasing amounts of carefully executed fieldwork during the MSA, there is reason for optimism that contextual information will help archeologists to develop hypotheses to explain the meaning of these finds. Some colleagues accept these finds as definitive evidence of cultural modernity with fully developed symbolic communication, modern cognitive abilities including language (Henshilwood et al. 2002; d'Errico et al. 2003), while others are less convinced that these finds demonstrate proof of behavioral modernity.

### 23.5.4 Ornament

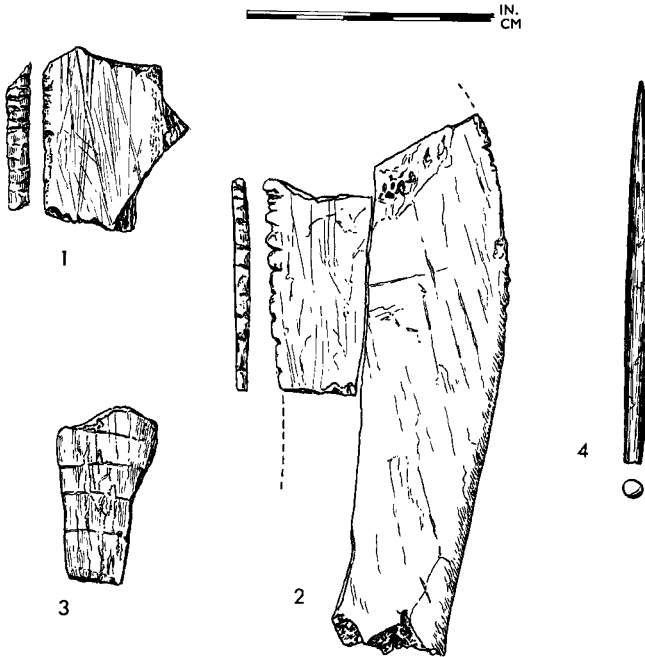
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The manufacture and use of ornaments convey social information about individual identity and group affiliation. This means of projecting assertive individual style or emblematic style reflecting social affiliation within a larger demographic group (Wiessner 1983) is an important characteristic of modern behavioral patterns and has been the focus of much recent research (Vanhaeren 2002; Kölbl and Conard 2003). The archeological distribution of ornaments provides a clearer signal than many of the classes of finds considered above.

Early evidence for the use of marine shells as ornaments comes from burial contexts from Qafzeh Cave in Israel and dates to about 100 ka (Bar-Yosef and Vandermeersch 1993). Slightly younger examples of perforated marine shell ornaments come from Still Bay deposits at Blombos Cave dating to about 75 ka (Henshilwood et al. 2004). Starting roughly 40 ka, personal ornaments have been documented in many parts of the Old World. Early ornaments include ostrich eggshell beads from early LSA contexts in Enkapune Ya Muto rockshelter, Kenya, with associated radiocarbon measurements between 30 and 40 ka (Ambrose 1998). AMS radiocarbon dates directly on ostrich eggshell beads from deposits

representing the transition from the MSA to LSA at Mumba Cave in Tanzania (► [Figure 23.5](#)) (Weiß 2000; Conard 2004a) have yielded multiple dates between 29 and 33 ka, and lend support to the early dates from Enkapune Ya Muto. There

■ **Figure 23.5**  
Klasies River Mouth, South Africa. Bone artifacts from Middle Stone Age deposits ca. 75,000 years old (after Singer and Wymer 1982)



is every reason to assume that these East African ornaments were made by anatomically and presumably culturally modern people.

Excavations at Ksar Akil in Lebanon (Azoury 1986) and at Üçağizli in the Hatay Province of Turkey (Kuhn et al. 1999, 2001) have produced rich assemblages of perforated marine shells from Initial Upper Paleolithic contexts dating to about 40 ka (► [Figure 23.6](#)). Similar finds have been recovered from other Mediterranean early Upper Paleolithic contexts, including Riparo Mochi on the Ligurian Coast of Italy (Kuhn and Stiner 1998; Stiner 1999).

Elsewhere in Europe there is considerable evidence for a rapid spread in the use of ornaments with the beginning of the Upper Paleolithic. Neanderthals apparently created a wide range of perforated and incised ornaments in Châtelperronian contexts such as at Grotte du Renne at Arcy-sur-Cure (Leroi-Gourhan and Leroi-Gourhan 1964; d’Errico et al. 1998; Baffier 1999). At more or less the

**■ Figure 23.6**

**Mumba Cave, Tanzania. Ostrich eggshell beads radiocarbon dated between 29,000 and 33,000 radiocarbon years ago scale in millimeters (photo H. Jensen)**



same time, numerous examples of early Aurignacian ornaments have been recovered from several regions including the Swabian sites such as Vogelherd, Geißenklösterle, and Hohle Fels (Conard 2003a) (▶ [Figure 23.7](#)). In addition to incised and perforated natural forms such as teeth, these artifacts include diverse ornaments made of mammoth ivory. It is noteworthy that many of the oldest forms of ornaments in Europe are not only perforated shells or teeth, but also completely carved, three-dimensional ivory beads, pendants, and figurines in which the maker completely dictated the form of the artifact.

Although earlier examples of personal ornament are known, by around 40 ka, examples of ornaments are well documented across much of the Old World. These data are consistent with the hypothesis that modern cultural behavior spread rapidly between roughly 30 and 50 ka. Shell beads from Mandu Mandu Creek Rock Shelter in Western Australia dating to more than 30 ka (Morse 1993) suggest that the use of personal ornaments was indeed widespread at an early date. Although Australia lies outside the scope of this review, the colonization of Sahul was an event in prehistory that required crossing the vast open water of Wallacea with rafts or other forms of boats. The best available dates for the colonization lie in the range of ca. 42–45 ka and fit with the pattern

**Figure 23.7**

Üçagizli Cave, Turkey. Perforated marine shell ornaments dating to ca. 40,000 radiocarbon years ago (after Kuhn et al. 2001)



suggesting the rapid spread of advanced behavioral patterns at about this time (O'Connell and Allen 1998, 2004).

### 23.5.5 Figurative representations

The presence of figurative art has been universally accepted as an indication of behavioral modernity. As far as I am aware, no one has disputed that figurative representations are a hallmark of modern cultural behavior. Mann (2003) has gone so far as to argue that representational art is the “gold standard” by which behavior modernity can be identified and measured.

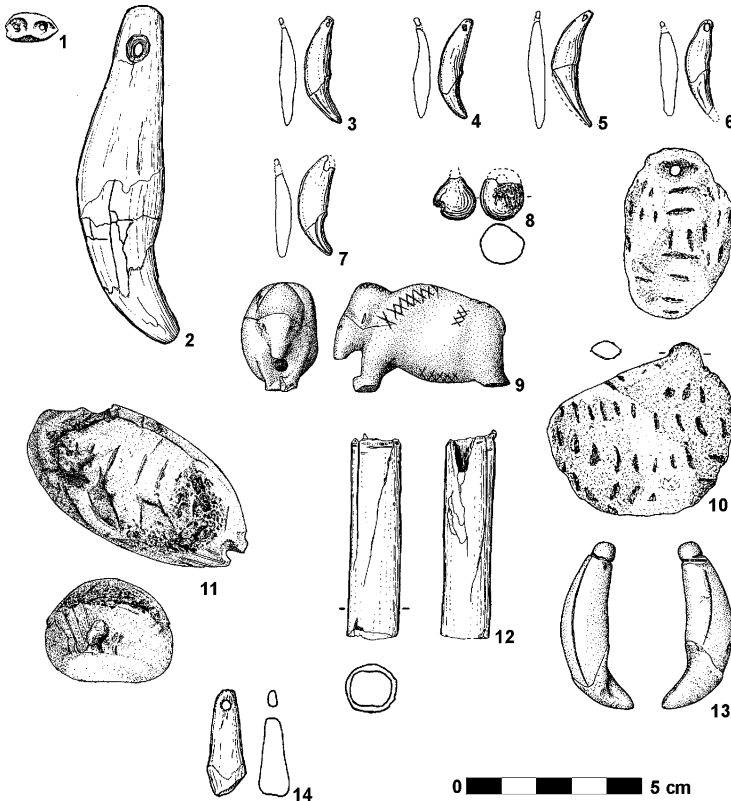
In Africa, the earliest figurative art is from the late MSA of Apollo 11, dating between 25,500 and 27,500 radiocarbon years ago (Vogelsang 1998). These examples

of painted mobile art depict a number of animals, geometric forms and a possible therianthrope (► [Figure 23.8](#)). The Middle Pleistocene aged, anthropomorphic-shaped stone from Tan Tan, Morocco (Bednarik 2003), much like a similar object from Berekhat Ram, Israel (Goren-Inbar 1986; Goren-Inbar and Peltz 1995; d'Errico and Nowell 2000), appears to be a modified natural form rather than deliberately carved figurine. In the Levant there is little or no evidence of figurative art before 30 ka.

The situation in Europe is very different in that several sites have provided evidence of figurative representation between 30 and 40 ka. The earliest figurative art includes the mammoth ivory figurines from four caves in Swabia in southwestern Germany (Hahn 1986; Schmid 1989; Conard and Bolus 2003; Conard 2003b) and several red monochrome paintings from Fumane in northern Italy (Broglio 2002; Broglio and Dalmeri 2005). The Swabian caves of Vogelherd,

■ **Figure 23.8**

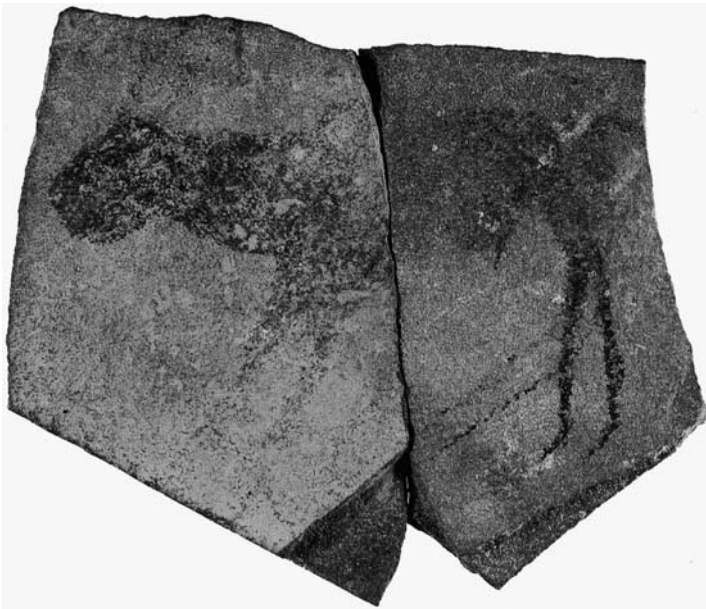
Sirgenstein, Bockstein Cave, Hohlenstein-Stadel, Vogelherd, Bockstein-Törle, Germany. Personal ornaments from the Aurignacian dating to ca. 36,000–30,000 radiocarbon years ago (after Conard 2003a)



Hohlenstein-Stadel, Geißenklösterle, and Hohle Fels have produced about 20, mostly very small, ivory figurines and figurative representations in bone and stone dating well in excess of 30,000 radiocarbon years, which corresponds to closer to 40 ka in calendar years. Due to the noisy radiocarbon signal in this period and above-average  $^{14}\text{C}$  production, the radiocarbon ages at the Swabian Caves and the similarly aged deposits from Fumane significantly underestimate the age of these artworks. The Swabian ivory figurines include depictions of lions, mammoths, horses, bison, bears, a water bird, and two or perhaps three therianthropes that combine features of lions and humans (Hahn 1986; Conard 2003b) (🔗 [Figures 23.9](#) and 🔗 [23.10](#)). These artworks are small and beautifully carved. They stand in sharp stylistic contrast to the highly schematic paintings of animals, unknown forms, and a possible therianthrope from Fumane (Broglio 2002). Geißenklösterle has also produced a painted rock from this period that preserves traces of red, yellow, and black pigments (Hahn 1986).

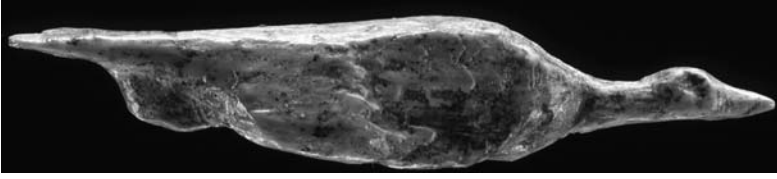
Most of the spectacular paintings from Grotte Chauvet in the Ardèche region of southern France appear to slightly postdate the examples of figurative art from Swabia and Fumane (Clottes 2001) (🔗 [Figure 23.11](#)). Here, numerous depictions of animals date back as far as 32,000 radiocarbon years ago. The selection of animals depicted in Chauvet, with an emphasis on dangerous, strong, and large

■ **Figure 23.9**  
Apollo 11 Cave, Namibia. Figurative painting from Middle Stone Age deposits dated with radiocarbon to ca. 27,000 years old (after Vogelsang 1998)



**■ Figure 23.10**

Hohle Fels, Germany. Waterfowl made from mammoth ivory, ca. 32,000 radiocarbon years old. Length 47 millimeters (after Conard 2003b)

**■ Figure 23.11**

Hohle Fels, Germany. Lion-man made from mammoth ivory, ca. 32,000 radiocarbon years old. Scale in millimeters (after Conard 2003b)



animals, shows remarkable similarities to the Aurignacian figurines from Swabia and no stylistic similarities to the simple depictions from Fumane. Other important sites in this context include Stratzing in Lower Austria, where a human figurine of stone has been dated to between 30 and 32 ka. Abri Cellier,



La Ferrassie, Abri Blanchard, and Abri Castanet in southwestern France have produced representations of animals and vulvas dating to about 30,000 radiocarbon years ago (Leroi-Gourhan 1995).

These figurative depictions from European contexts are the oldest known worldwide. They all date to the early Upper Paleolithic and were presumably made by modern humans; however, as far as we can tell, Neanderthals still occupied parts of Europe at this time, roughly 40 ka. At present, there is no concrete evidence for a direct association between modern humans and early figurative art in Swabia. Thus, for now, the hypothesis that Neanderthals created the figurative art and other remarkable finds of the early Aurignacian, although improbable, cannot be refuted (Conard et al. 2004a).

The specific context in which figurative art developed has been the subject of considerable discussion of late and will not be elaborated on here (Lewis-Williams 2002; Conard and Bolus 2003). Regardless of the specific social–cultural mechanisms that led to the development and spread of figurative art, there is a consensus among archeologists and paleoanthropologists that the makers of these early artistic traditions were culturally modern people (Churchill and Smith 2001). While many other advanced behavioral forms have precursors in earlier periods, there is no convincing evidence for figurative depictions prior to the beginnings of the European Upper Paleolithic.

### 23.5.6 Music

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Perhaps because of the long research tradition and favorable taphonomic conditions, the earliest examples of musical instruments have been recovered from early Aurignacian contexts in Swabia (Hahn and Münzel 1995; d’Errico et al. 2003; Conard et al. 2004b). As is the case with figurative representations, evidence for music and musical instruments can be seen as an indication of fully developed cultural forms based on symbolic communication. The assumption in this context is that where there is figurative art and music, there must have been fully developed language, by which Paleolithic people assigned specific concrete and abstract meaning to words and could efficiently communicate information about the past, present, and future. Thus, where there is figurative art and music, there must have been behaviorally modern people.

While speech, song, music, and dance presumably existed still earlier, the oldest musical instruments known are two bone flutes and one mammoth ivory flute from archeological horizon II at Geißenklösterle (Hahn and Münzel 1995; Conard et al. 2004b). This deposit has been dated by thermoluminescence to about 37,000 BP and to several thousand years younger with radiocarbon.

**■ Figure 23.12**

**Grotte Chauvet, France. Early Upper Paleolithic parietal art radiocarbon dated to ca. 30,000 years ago (after Clottes 2001)**



The better preserved of the bone flutes is made of the radius of a swan (● [Figures 23.12](#) and ● [23.13](#)). Reconstructions of the instrument produce a high-pitched but pleasing music. Friedrich Seeberger (2002, 2004) has recently recorded a CD of Ice Age music played on a reconstructed bone flute of the kind known from Geißenklösterle. This flute can be played without a reed and is clearly a flute rather than a reed- or trumpet-voiced instrument as suggested by d’Errico and colleagues (2003). While Aurignacian musicians may have played very different-sounding music, Seeberger’s playing provides a striking impression of what this early Upper Paleolithic music may have sounded like.

Recent excavations at Vogelherd have also produced fragments of worked bird bones that appear to be remains of a flute, but further work is needed to confirm this preliminary conclusion (Conard and Malina 2006).

Other sites, most notably Isturitz in the French Pyrenees, have produced additional flutes and indicate that wind instruments were in fairly wide use during the early Upper Paleolithic (Buisson 1990; d’Errico et al. 2003). Of course, there are countless other less conspicuous forms of percussion and wind instruments that could have existed during the early Upper Paleolithic or still earlier, yet they remain to be identified. Claims for earlier examples of Middle Paleolithic flutes have generally been met with skepticism in archeological circles, as was the case with recent claims for a Middle Paleolithic flute made from a cave bear bone from Divje Babe in Slovenia (Turk 1997; Albrecht et al. 1998).

**Figure 23.13**

Geißenkösterle, Germany. Aurignacian flute made from mammoth ivory, ca. 33,000 radiocarbon and 37,000 thermoluminescence years old. Length 18.7 cm (photo H. Jensen)



## 23.6 Conclusions

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This overview has touched on some, but by no means all, of the evidence for the development of behavioral modernity. I have mentioned some of the main data sets and lines of reasoning that play a role in the discussions and debates about the origins of modern behavior. This leads to the question of by what means, where, and under what circumstances behavioral modernity arose and which of the hypotheses for its origins lies closest to the mark?

The answers to these questions depend on how the evidence is weighed and interpreted. From my point of view there can be no doubt that European Aurignacian societies by roughly 40 ka had all of the hallmarks of modern behavior including Mann's "gold standard" of figurative art as well as musical instruments. The best evidence for early figurative art and music comes from the caves of the Swabian Jura. While one could argue that some important Upper Paleolithic artifact forms developed in the Upper Danube drainage in the period around the time of the arrival of modern humans, naming this region as the single global center for the origin of cultural modernity would be a radical and naive interpretation. The contemporary finds of figurative art from Fumane, and slightly later finds from southern France, indicate that the beginnings of the Upper Paleolithic reflect a time in which archaic behavioral forms were replaced across the board by behavioral forms that lie within the range of modern variability. This transition appears to have begun across much of Europe about 40 ka when modern humans entered a continent inhabited by Neanderthals. Based on the presence of late Neanderthals in several regions of Europe (Hublin et al. 1995; Smith et al. 1999), it appears that there must have been a period in which both archaic and modern humans coexisted in Europe, and contact between the two forms of people must have occurred. Given the poor chronostratigraphic resolution and lack of human fossil material during this key period between roughly 30 and 40 ka, it is difficult to specify exactly how long both hominids coexisted in specific regions (Conard and Bolus 2003).

Early anatomically modern humans at Skuhl and Qafzeh in the Levant predate many remains of Neanderthals in southwestern Asia and point to an initially successful colonization of the region. The reappearance of Neanderthals in the Levant by roughly 60 ka suggests that Neanderthals had more successful adaptations and demographic advantages over anatomically modern humans in interactions dating to the middle part of the Late Pleistocene. While evidence for strict contemporaneity is still lacking, this observation indicates that in some settings in which both hominins produced Middle Paleolithic artifact assemblages, Neanderthals had the upper hand. However, in later encounters the situation was different. At about 40 ka, modern humans arrived in western Eurasia with better-developed cognitive skills (Lewis-Williams 2002) or behavioral advantages (Marean 2005) that led to demographic success relative to the indigenous Neanderthals. In western Eurasia, a period of dynamic equilibrium between Neanderthals and anatomically modern populations existed, in which moderns presumably profited from the knowledge and cultural practices of the archaics and vice versa.

There is little reason to postulate a violent rapid advance of Neanderthals into the Levant replacing indigenous anatomically modern humans in the middle of the Late Pleistocene, and similarly there is little reason to assume that the arrival and spread of modern humans into Europe was either universally rapid or brutal. On the contrary, the transition from the Middle to the Upper Paleolithic and the infiltration and eventual complete dominance of *Homo sapiens sapiens* in Eurasia probably took on countless local ecologically and historically dictated variants in which there was considerable give and take between archaic and modern humans. This pattern is reflected in the diverse regional signatures of the archeological records from nearly every region that has produced relevant data for this transition. These data show very different archeological signatures depending on the environmental and social-cultural setting encountered by incoming populations (Conard 1998; Conard and Bolus 2003). Evidence from the sites occupied by late Neanderthals indicates that they too manufactured and used ornaments (Baffier 1999), and as we have seen above, there is little that separated the patterns of technology, subsistence, and settlement reflected in Middle Paleolithic artifact assemblages from those of the MSA or early Upper Paleolithic. Still, some time presumably in the early and middle parts of the Late Pleistocene and certainly no later than 40 ka, people began producing material cultural remains that allow us to identify behavioral modernity. This pattern of behavior was carried primarily, but apparently not exclusively, by anatomically modern humans.

Many characteristics of modern behavior can be found across much of the Old World, and the distribution of advanced cultural traits is significantly determined by the intensity of research in different regions. The recent trend of important discoveries being made in MSA contexts in Southern Africa will no doubt continue as more work is done. The data from Klasies River, Apollo 11, Rose Cottage Cave, Blombos, Sibudu, and Diepkloof clearly show the enormous potential of the subcontinent. Elsewhere, a similar intensification of research would perhaps produce a similar increase in data relevant to the definition of cultural modernity. While western Eurasia also has considerable potential, there is less reason to assume that the archeological record will be so radically transformed by further work. Instead, important gaps will be filled and, presumably, gradually a more complete picture of the highly variable behavioral patterns during the Lower, Middle, and Upper Paleolithic will emerge. With time we will be better able to develop and test new hypotheses for the evolution and spread of cultural modernity.

Based on the data presented above, a strict unilinear and monogenetic model for the evolution of behavioral modernity appears less likely than a pattern of highly variable polygenetic development. These data suggest that MSA and

Middle Paleolithic societies generally existed within regionally specialized social groups with highly variable material culture. Whether anatomically modern or archaic, these people lived at a similar level of technological and cultural development. Perhaps by about 80 ka or possibly as few as 40–50 ka, full behavioral modernity developed in Africa and in Eurasia. Most archaic humans appear not to have completely mastered the repertoire of new behaviors including fully developed symbolic communication. If, however, late archaic humans, including Neanderthals, were culturally fully modern, their behavioral patterns still put them at a reproductive and demographic disadvantage in comparison with the anatomically and culturally modern social groups that propagated across the Old World. The extinction of Neanderthals does not necessarily mean that they were not culturally modern, just as the extinction of local groups of *Homo sapiens sapiens* does not mean that they were not culturally modern. The main characteristic of *Homo* is that our cultural development can and does vary independent of our biological morphology (Conard 1990). Thus late anatomically archaic peoples may have been behaviorally modern, just as early anatomically modern humans may well have been behaviorally archaic (Zilhão 2001).

In the coming years, archeologists and paleoanthropologists need to establish high-quality regional databases and specific local scenarios and hypotheses for the evolution of modern patterns of behavior (Hublin et al. 1996; Parkington 2001; Lewis-Williams 2002; Conard and Bolus 2003). As work progresses researchers should be able to test these hypotheses and better define these diverse regional scenarios to create new models that come closer to reflecting the evolutionary reality that a nuanced history of our species warrants. This work should proceed using multiple analytical paradigms and shifting scales of analysis (Conard 2001). There are certainly multiple approaches to this complex problem, and all contextually informed explanatory models for the rise of cultural modernity are welcome, regardless of whether they originate from the natural sciences, social science, or humanities.

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