DISCUSSION 4: The Middle-to-Upper Paleolithic Transition: What News?

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Abstract This chapter reviews the state of the research on the Middle to Upper Paleolithic transition following profound paradigm changes in the last three decades. The demise of the Eurocentric paradigm, which saw a linear shift from Neanderthals to moderns and from Middle to Upper Paleolithic lifeways, opened the field to a large number of competing hypotheses about the origins of modern humans and of modern behavior. It is suggested that the Middle-to-Upper Paleolithic transition is a complex phenomenon that constitutes regional processes. Some of the new models attempting to explain the Middle-to-Upper Paleolithic transition are a geographic and temporal projection of the Eurocentric thinking about the links between anatomical and behavioral modernity. While some researchers still employ empirical data as the building stones of their models, others strive to come up with theory-driven explanations for the shift from "archaic" to "modern" behavior.

Keywords Paradigm shift • Modern behavior • Out of Africa

"The Middle to Upper Paleolithic Transition" is a term that was coined in the good old days when the prehistoric record of Europe was a yardstick of human prehistory. The notion of a linear shift from archaic to modern anatomy, which was inseparably tethered to a change from Middle Paleolithic ("archaic") to Upper Paleolithic ("modern") lifeways was elegant and attractive. It had been taken as a given that the cognitive potential for modern behavior evolved with (some would say as a result of) modern anatomy, and its emergence directly led to tangible archaeological evidence of such behavior (e.g., parietal and mobile art or personal ornaments; Mellars, 1996; Noble and Davidson, 1993). Moreover, the notion of a combined biocultural "package" of modernity catered to a sense of "species self-esteem," as it emphasized the uniqueness of "us" (i.e., *Homo sapiens*) compared to all those extinct hominins that "had not made it" across the rubicon of modernity. Any different outlook on how modern behavior emerged and evolved had implications that were too difficult to handle conceptually: if one allowed for the existence of latent modern capacities that were not expressed in the material record, or assumed that hominins other than modern *Homo sapiens* were capable of modern behavior, all bets would be off. Detailed schemes of cultural stages and our understanding of the tempo of behavioral and cultural evolution could become unfounded scenarios (Hovers and Belfer-Cohen, 2006). The strength of the paradigm was such that there was not much of a theoretical framework from which models were derived. The shift from a Neanderthal to an Upper Paleolithic "stage" was perceived as a preordained process of cultural evolution, and the archaeological record—namely the skeletal and archaeological evidence—was deemed pretty much self-explanatory. Modern behavior—i.e., Upper Paleolithic behavior—was simply recognized through a number of traits that were thought

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to represent its existence accurately and appropriately (Henshilwood and Marean, 2003).

The major challenges to the Eurocentric paradigm came from regional records outside of Europe, as well as the application of new analytical tools. Findings in the Levant from as early as the 1920s have been pivotal in this change. While the discovery of the Tabun C1 Neanderthal skeleton with Mousterian lithics was par for the course within the then-dominant worldview of prehistory, this was not the case with the Skhul skeletal remains, which were found associated with classic Mousterian assemblages despite their *Homo sapien*-like anatomical features (McCown, 1934; McCown and Keith, 1939). Qafzeh Cave presented a similar dilemma (Tillier, 1999; Vandermeersch, 1981). Based on their anatomy, the Skhul remains were variably classified, first as a "Palestinian variant of Neandertals" (Keith in McCown, 1934), and then as intermediate forms between generalized Neanderthals and the modern humans succeeding them ("Proto Cro-Magnon," Howell, 1958). Yet the strength of the biocultural paradigm was such that as late as the 1980s, these Levantine caves were widely regarded as providing the clearest evidence for a transitional phase between Neanderthals and modern humans, with a relatively late date for the transition (Howell, 1959; Suzuki and Takai, 1970; Wolpoff, 1996). The postulated transitional phylogenetic status of the hominins was argued to have been reflected in cultural manifestations as well, specifically in the characteristics of lithic assemblages made by these transitional forms (Jelinek, 1982; Watanabe, 1970).

Anatomical studies of Levantine fossils (Rak, 1986, 1990; Vandermeersch, 1981, 1982) argued against anagenetic change, and supported the view that there were two different taxa in the Levantine Middle Paleolithic (e.g., Aiello, 1993; Klein, 1995; Rak, 1993; Vandermeersch, 1982). Additionally, a geochronological database for Levantine Mousterian sites, including those with skeletal remains, has begun expanding since the mid-1980s. This database now indicates that in the Levant modern humans may have antedated, or were to some degree contemporaneous with the Neanderthal-like hominins (Bar-Yosef, 1998; Grün et al., 2005; Rink et al., 2001; Valladas et al., 1999). Moreover, the dates of 120,000–85,000 years ago for Skhul and Qafzeh render these sites contemporaneous with Neanderthals in Europe itself (the dating of Tabun, in which the longest sequence was found, unfortunately remains problematic; Bar-Yosef and Callander, 1999; Grün and Stringer, 2000; Meignen et al., 2001; Mercier and Valladas, 2003). Some level of coexistence between Neanderthals and modern humans can no longer be considered a uniquely Levantine trait. Some Neanderthal groups continued to exist in Europe well after the arrival of *Homo sapiens* (Higham et al., 2006; Mercier et al., 1991; Schmitz et al., 2002). Still, one telling difference is that there are no known instances in Europe of modern humans that produced Mousterian lithic assemblages, whereas Neanderthals are by and large associated with Mousterian assemblages. In the Levant, both Middle Paleolithic populations produced their lithic assemblages by applying Levallois flaking, and used a comparable range of typological forms. Additionally, faunal residues found at sites with human skeletal remains show that both groups exploited similar faunal species by hunting (Rabinovich and Hovers, 2004; Rabinovich and Tchernov, 1995; Speth and Tchernov, 1998, 2001; Stiner, 2006; Ysehurun et al. 2007). Thus, the Levantine Mousterian record that has been emerging in the last three decades not only refutes the notion of a linear anatomical transition between Neanderthals and moderns, but also severs the conceptual Gordian Knot between a package of "biocultural" modernity on the one hand vs. archaic anatomy and Middle Paleolithic tool types on the other (Hovers, 2006, 2009).

Genetic studies, which became part of the analytical arsenal of modern human origin research, played a major role in the demise of the old paradigm. While the results are by no means unanimously accepted, they are consensual in pointing toward Africa as the geographical origin for the genetic configuration of extant humans. Multiple lines of genetic and anatomical data currently coalesce in Africa as the place of origin of *Homo sapiens*. Yet, the mechanisms of its emergence and of its becoming a colonizing species are still being debated. The genetic and fossil data are sometimes interpreted as suggesting the emergence of *Homo sapiens* from a speciation event in Africa, followed by bottle necks, dispersals, and the subsequent replacement of archaic populations in Eurasia.

Such seemingly decisive analyses of modern and fossil human DNA, interpreted as supporting a recent African origin of anatomically modern humans, continue to be challenged on both methodological and interpretive grounds. The data are alternatively viewed as indicating an African origin followed by periods of gene flow. A third view endorses a process of wave-diffusion, including hybridization and assimilation at the wave front. Similarly, the chronological framework for such events and processes is as yet unresolved (see Arcadi, 2006; Bazin et al., 2006; Cann, 2001; Caramelli et al., 2003, 2006; Eswaran, 2002; Eswaran et al., 2005; Green et al., 2006; Harpending et al., 1998; Krings et al., 1997, 2000; Mellars, 2005; McDougall et al., 2005; Noonan et al., 2006; Relethford, 2001; Templeton, 2002; White et al., 2003 for recent discussions).

Things are as confusing on the cultural side. On the African continent itself, various behaviors that are accepted as markers of modernity emerged during the Middle Stone Age, such as composite tool making, the use of symbolic paraphernalia, long-distance raw material transport, and the use of marine food resources (Ambrose and Lorenz, 1990; Botha, 2008; Bouzouggar et al., 2007; d'Errico et al., 2005; Henshilwood et al., 2002; Lombard, 2005; Marean et al., 2007; McBrearty and Brooks, 2000; Watts, 2002; Würz, 1999; to name but a few). Initially, the Middle-to-Upper Paleolithic transition was "projected" from Europe onto Africa and pushed back in time to accommodate the early dates of *Homo sapiens* in sub-Saharan Africa (e.g., Mellars, 2006; McBrearty and Brooks, 2000; McBrearty and Tryon, 2006). Not all of the cultural changes, however, evolved continuously, and some disappeared in the later stages of the MSA in order to re-emerge again in the Late Stone Age (Soriano et al., 2007). In the Levant, intentional burials exist among both modern humans and Neanderthals, similar to the European Neanderthals (Belfer-Cohen and Hovers, 1992; Hovers et al., 1995, 2000). Symbolic use of pigments and shells is encountered among the modern populations of the region in the Middle Paleolithic (Bar-Yosef Mayer et al. 2009; Hovers et al., 2003; Taborin, 2003; Vanhaeren et al., 2006), who also used pyrotechnology to obtain the red color of iron ores (Godfrey-Smith and Ilani, 2004). Yet, the earliest Upper Paleolithic cultures in the Levant do not demonstrate any of the traits of a "full-fledged" Upper Paleolithic. In fact, were one to adhere to the trait list, we'd have to argue that Levantine populations did not reach "modernity" prior to the beginning of the Natufian, some 15,000 cal BP (Belfer-Cohen and Hovers, n.d.)! Interestingly, Sahul shows a similar pattern. This continent was first occupied by modern humans ca. 45,000 years ago (O'Connell and Allen, 2004), presumably soon after the major "out of Africa" event through which modern humans spread all over the world. Still, many of the supposed hallmarks of a "symbolic revolution" did not appear until the mid-Holocene, and occur sporadically, if at all, in the archaeologically visible manifestations of the Pleistocene (Brumm and Moore, 2005; Habgood and Franklin, 2008; O'Connell and Allen, 2007).

The long duration of the Middle Paleolithic and Middle Stone Age entities could not have occurred without behavioral flexibility and dynamic responses of hominins to the particular challenges of their environments (both social and cultural). Yet these dynamics too often go unrecognized because they did not necessarily evolve toward what eventually became the Upper Paleolithic (Hovers, 1997, 2006; Hovers and Belfer-Cohen, 2006). One can envision Middle Paleolithic hominins (as well as some Upper Paleolithic groups in some regions) existing in an evolutionary "rugged fitness landscape" (Palmer, 1991), with variable peaks of suboptimal fitness values separated by troughs of low-fitness adaptive states. The landscape can thus host several populations in suboptimal conditions. "If ... we imagine a very rugged fitness landscape, with many peaks and troughs, then ... Middle Paleolithic populations were in fact evolving behaviorally, their fitness was increasing locally, but they happened to be ascending a peak (or more likely several peaks) different from the one that anatomically modern Upper Paleolithic populations eventually climbed" (Kuhn, 2006:118).

To summarize, it has become apparent in the last two decades that biological and cultural changes during the Upper Pleistocene—including those idiomatically described as the Middle to Upper Paleolithic transitions—did not necessarily coincide across time and space, nor did they follow a single, repetitive pattern when they occurred (Bar-Yosef and Pilbeam, 2000; d'Errico et al., 1998; Hovers,

1997, 2009; Hovers and Belfer-Cohen, 2006; McBrearty and Brooks, 2000). Nor should we expect homogeneity of the process. Because the Middle Paleolithic differed from one region to the other, regional historical processes to which it gave rise could hardly be uniform or follow a single path to a single transition. This argument should hold regardless of the specific model of population interactions one chooses to endorse. The "Upper Paleolithic Revolution" is essentially technological and very likely may have had a single region of origin (Bar-Yosef, 2002), but it seems that it was implemented in many different ways.

In the early 21st century, one cannot in good faith talk about *A* single Middle to Upper Paleolithic transition. They may all be linked to the dispersal of modern humans out of Africa some 50,000 years ago, but they were many and varied—in Europe as much as in other places on the globe. Indeed, the various papers in this section, explicitly (e.g., Olszewski, Riel-Salvatore) or implicitly endorse this changing world view and emphasize regional differences in the "transitions" that they discuss. Practically all the authors recognize that the "Transition" across Europe, as well the specific cases with which each writer deals, are mosaic events rather than many manifestations of a monolithic process.

Archaeologists—perhaps more than researchers in other disciplines of paleoanthropology—need to go back to the drawing board. A scientific revolution has been completed, and the formidable paradigm that served us for many years has been overthrown. We are no longer looking at a process that is simple or elegant. The emerging complexity of the time period between 50,000 to 30,000 years ago requires special attention to theoretical considerations, calling into question the conventional time-stratigraphic units that are used to divide the Upper Pleistocene material record, as emphasized also by Harrold. The very same situation also calls for emphasis on (literally) down-to-earth aspects of the archaeological record. If we are to make sense of the mosaic of behaviors that are encountered globally at the 50,000–30,000 years ago time interval, we should be able to generate theory-motivated research rather than empirically-driven "trait lists" that cannot be tested independently of the archaeological data themselves (Henshilwood and Marean, 2003; Marean and Assefa, 2004). Riel-Salvatore tackles this very issue with regards to Uluzzian lithic technology. While the label "transitional" for the multiple industries at the Middle to Upper Paleolithic transition is devoid of any implicit behavioral meaning (Bar-Yosef, 2006a; Kuhn, 2003), the Uluzzian (and other "transitional" industries) is still perceived as evidence for Neanderthal acculturation by moderns. This allows Riel-Salvatore to set a series of questions about specific links between the Uluzzian and the preceding Mousterian, including the geographic space in which the two industries are known, and the similarities in particular technological practices. In other words, the "transitional" status of the industry is not assumed; rather it is examined and tested according to a model of cultural evolution. In this particular case, it is concluded that the Uluzzian represented a distinct behavioral package, detached from the preceding Mousterian. And because it lasted for several thousand years, it cannot be termed a "transitional" industry. To the extent that the Uluzzian is one of the "big three" Middle-to-Upper Paleolithic transitional entities in Europe (the others being the Chatelperronian and the Szeletian), this raises interesting questions about the two other industries. Interestingly, the Buhonician, which many workers view as *the* transitional industry in Europe due to its manifested technological ties with the transitional or very early Upper Paleolithic assemblages of Boker Tachtit in Israel (e.g., Bar-Yosef, 2006b; Tostevin, 2003), is not discussed here. Other contributors to this section do not explore such theoretical questions to the same degree, yet clearly have them on their minds when writing about the situation in Iberia, for example.

On the other hand, the many variants of the newly recognized Middle to Upper Paleolithic transition require that archaeologists be very careful with the raw data that they retrieve. It is all too easy to create new transitional industries where a geological mixture of sediments is not taken into account. Three papers in this section (Adams, Zilhão and to some degree, de Quiros and Maillo) explicitly explore this very topic in their studies of three caves in different regions of Europe. Each of these case studies illustrates how site formation processes, if not monitored properly, introduce stratigraphic artifacts into the record and distort the understanding of time depth and industrial variability.

A number of contributors to this section adopt a holistic approach to the transition, alternating between cultural and biological data sources to support either cultural or biological arguments. The gradual elimination of modern human fossils from the Upper Paleolithic record of Europe is indeed frustrating (Bednarik). Most scholars still maintain that the authors of the Aurignacian are in all likelihood modern humans, but with Neanderthals' long-term survival in some areas of Europe, the point is that much more difficult to logically defend. Currently, there is no positive proof in the form of skeletal remains as to the identity of the makers of the earliest Upper Paleolithic industries, whereas Neanderthal authorship of "transitional" (i.e., Châtelperronian) assemblages has been claimed (and hotly debated) in only a handful of cases (at Saint Césaire and Arcy-Sur-Cure; Bordes, 2002; d'Errico et al., 1998; Gravina et al., 2005; Mellars and Gravina, 2008; Vandermeersch, 1984; Zilhão and d'Errico, 1999; Zilhão et al., 2008a, b). Neanderthal acculturation is the basic premise of Riel-Salvatore's null hypothesis that the Uluzzian is a transitional industry, while Harrold's review runs the gamut of acculturation to various forms of replacement models to fortuity, with the arrival of moderns and the demise of the Neanderthals perceived as unrelated events (Finlayson, 2004). Obviously, lithics and other material remains were made by hominins that belonged to either one or the other taxonomic groups. However, we must bear in mind that links between biological taxonomy and material culture (specifically, lithics) are loose, if they exist at all (Hovers, 2006; Lieberman and Bar-Yosef, 2005); and the two data sets should be handled independently where possible to avoid collapsing the various lines of evidence uncritically.

Research on the transitions from the Middle-to-Upper Paleolithic is practically starting anew, particularly in Europe. These are exiting times for workers on these industries who have at their disposal an unprecedented variety of genetic, biomolecular, anatomical and cultural models, and data sets to help streamline their thoughts and works. As noted by Harrold, the influence of the alternative models is already evident in recent studies. The collection of papers in this section reflects the difficulties imposed by a legacy of research history and tradition combined with the intellectual excitement of making new headways in research. "The Middle to Upper Paleolithic Transition" is not a topic that will disappear from center stage anytime soon.

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