Life and Death at the Peștera cu Oase
Life and Death at the Peștera cu Oase

A Setting for Modern Human Emergence in Europe

Edited by Erik Trinkaus, Silviu Constantin, João Zilhão
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Life and Death at the Peștera cu Oase
Part Six

Discussion
Paleoanthropological Implications of the Peștera cu Oase and Its Contents

Erik Trinkaus and João Zilhão

Introduction

The initial discovery and exploration of the Peștera cu Oase by Ş. Milota, L. Sarcină, and A. Bilgăr in early 2002 was in the context of the exploration and documentation of the Plopa-Ponor karstic cave system (Chapter 2). However, with the discovery of a human mandible on the surface of (what became) the Sala Mandibulei, its subsequent removal and eventual dating to ~35 ka 14C BP (~40.4 ka cal BP) by fall 2002, the focus of the work in the Peștera cu Oase became a paleoanthropological one. This shift in focus led to the 2003 short field season with the discovery of the Oase 2 facial skeleton and partial neurocranium and then to the substantial 2004 and 2005 field seasons, with the excavation of the Panta Strâmoșilor and the sampling and mapping of the other passages above and below it (Chapter 3). Indeed, the decision to excavate in the Panta Strâmoșilor and to leave the other passages largely undisturbed was made in part with the goal of recovering the remainder of the Oase 2 cranium and possibly other elements of the Oase 1 and 2 skeletons. It was also oriented toward being able to determine how the human remains came to be included among the plethora of cave bear bones in the cave.

The resultant fieldwork and laboratory analyses of the excavated and surface-collected remains has led to a suite of other analyses of the Peștera cu Oase. They have produced an extensive dating record for the region, being one of the few places in which different dating techniques at the limits of radiocarbon could be tested against each other (Chapters 6 to 8). It has produced a detailed karstic geological record in its regional context (Chapters 4, 5, 9, and 10). It yielded partial skeletons of wolves, deer, ibex, and other mammals, including the largest Cervus elaphus known from Pleistocene Europe (Chapters 14 to 17). The excavations provided one of the largest and best documented cave bear skeletal series, with insights into their paleobiology, diet, and paleobiogeography (Chapters 11, 12, 13, and 18). These data in combination yield general inferences about the paleoclimate of the region during the Late Pleistocene (Chapter 26). And the initial exploration and the subsequent fieldwork in the Peștera cu Oase have provided the oldest substantial fossils of morphologically “modern” humans in Europe (Chapters 19 to 25).

The Peștera cu Oase has provided (see references in Chapter 2), and will continue to provide, an abundance of data and ideas concerning the Interpleniglacial geology and paleontology of the southwestern Carpathians, or of southeastern Europe more generally. Yet, for better or worse, it is the discovery of the oldest substantial modern human fossils in Europe that provided much of the incentive for pursuing the nontrivial fieldwork, persuaded foundations and institutions to support the majority of the fieldwork, and has made the Romanian word for bones (oase) well-known in both the paleoanthropological world and the scientific media. These human remains have therefore become central to studies of human emergence, and especially to the emergence of modern human biology in Europe during the Interplenioglacial (Marine Isotope Stage [MIS] 3). They have also helped to change some of our perspectives on the paleoanthropological transition to “modern humans” and the “Upper Paleolithic” in the Late Pleistocene, in addition to shifting our perceptions of those (not so gentle) giants who were the primary occupants of the Peștera cu Oase, the cave bears.

Given this paleoanthropological focus of much of the work on the Peștera cu Oase, and bearing in mind the other substantial contributions of the fieldwork, laboratory
analyses, and comparative analyses, it is appropriate for us to reconsider the paleoanthropological implications of the Peștera cu Oase and its Late Pleistocene human remains.

The Human Paleontological Context

When the Oase 1 mandible returned a date of ~35 ka 14C before present (BP) in late 2002 (Chapters 2 and 19), there were few securely dated and diagnostic human remains from the same time period (Table 19.2), broadly coeval with the early phases of the Aurignacian (see following discussion). The Velika Pećina frontal had recently been shown to be mid-Holocene in age (Smith et al., 1999), as had the frontal bone from Hahnöfersand (Terberger et al., 2001). The crania, mandible and humerus from Vogelherd, considered by most to be later Aurignacian (e.g., Churchill and Smith, 2000) but some of which had a distinctly “Holocene feel” (at least to one of us), proved to be similarly Holocene in age (Conard et al., 2004). The large and historically important sample from Cro-Magnon, long since considered to be Aurignacian (Movius, 1969; see Petit-Maire et al., 1971), was shown to be early Gravettian in age (Henry-Gambier, 2002).

The substantial Mladeč sample was expected to be ~35 ka 14C BP (Svoboda, 2000), but attempts to directly date Mladeč 5 and rib fragments had failed (M. Oliva, pers. comm.; E. Trinkaus and P.B. Pettitt, pers. observ.); it was only in 2005 that reliable dates ~31 ka 14C BP were obtained from the human remains (Wild et al., 2005). The fragmentary Kent’s Cavern 4 maxilla, poorly assembled and minimally described by Keith (1927), was directly dated to ~31 ka 14C BP (Stringer, 1990), a date that has since been suggested to be at least four millennia too young (Jacobi et al., 2008; Higham et al., 2011) (but see discussion in Chapter 19). The La Quina Aval immature mandibles had an associated date of ~32.5 ka 14C BP, but the specimens were either minimally described (Henri-Martin, 1936) or known only through personal study (Trinkaus, 2002), and their Early Aurignacian association has been only recently confirmed (Verna et al., 2012). The final secure Aurignacian samples of 2002 are the Les Rois immature mandibles and isolated teeth, now known to date to the end of the Aurignacian (Ramirez Rossi et al., 2009) and the isolated teeth from Bacho Kiro (Glei and Kaczanowski, 1982). Further afield, charcoal associated with the Nazlet Khatar burials in Egypt had yielded an age ~37.5 ka 14C BP (Vermeersch, 2002). Interestingly, the first direct dates on the Romanian Cioclovina and Muierii human remains, dating them to 29–30 ka 14C BP, had been published (Pântescu, 2001), but they were unknown to us at the time and to the field outside of Romania.

Since the 2002–2003 discovery and dating of the Oase human remains, the sample of Aurignacian (or Aurignacian time period) diagnostic European human remains has expanded, mostly (but not entirely) through the direct dating and reassessment of previously collected remains. A morphologically modern pollical phalanx from Oblazowa Cave provided a direct date (Glei-Haduch, 2003; Housley, 2003). The contextually secure Early Aurignacian from Brassempouy provided isolated teeth and phalanges (Henry-Gambier et al., 2004), some of which are diagnostic of modern humans (Henry-Gambier et al., 2004; Bailey and Hublin, 2005). The Cioclovina 1 cranium, discovered without geological or archeological context (contra Rainer and Simonescu, 1942; see Sofi caru et al., 2007), yielded direct dates of ~29 ka 14C BP (Olariu et al., 2005; Sofi caru et al., 2007). Similarly, the Muierii skull and temporal bone, which had been redeposited into a Middle Paleolithic context, yielded dates of ~30 ka 14C BP (Olariu et al., 2005; Sofi caru et al., 2006; Dobos et al., 2010). In addition, the La Crouzade 6 maxilla has yielded a direct date of ~30.5 ka 14C BP (Henry-Gambier and Sacchi, 2008), and the Gravettian Paviland 1 skeleton now has dates of ~29 ka 14C BP (Jacobi and Higham, 2008). To these samples the Crimean Buran-Kaya III fragmentary material is now added (Prat et al., 2011); the stratigraphically secure Early Upper Paleolithic remains from the Kostenki sites are undiagnostic or undescribed (Sinitsyn, 2004; Anikovich et al., 2007); a series of contrasting direct dates are available for the Kostenki 2 (site XIV) skeleton, ranging from the mid-Holocene to ~33 ka 14C BP (Marom et al., 2012), but the extraordinarily good preservation of the remains (Sinitsyn, 2004) relative to all known earlier Upper Paleolithic burials in open air sites (cf. Buzhilova and Lebedinskaya, 2000; Sinitsyn, 2004; Svoboda, 2006a) raise persistent questions as to whether it was intrusive into earlier (Early and Mid) Upper Paleolithic levels.

Further east, in southwestern Asia, Early Upper Paleolithic human remains are scarce and generally poorly dated. The most complete is the child’s skull from Ksar Akil, probably ~35 ka 14C BP based on retrospective stratigraphic correlation (Bergman and Stringer, 1986), but that age is unconfirmed. There are scattered postcranial and a tooth from the Aurignacian of Hayonim Cave (Arensburg et al., 1990), there is an unpublished parietal fragment from the Baradostian Layer C of Shanidar Cave (Trinkaus, pers. observ.), and there are teeth of uncertain affinities from the pre-30 ka 14C BP levels of Üçağızı Cave (Güleç et al., 2007). Fragmentary human remains are known from Aurignacian/Baradostian levels of Kebara, el-Wad, Gar Arjeneh, and Eshkaft-e Gavi, and a partial skeleton comes from Nahal ‘En-Gev (McCown and Keith, 1939; Hole and Flannery, 1967; Arensburg, 1977; Scott and Marean, 2009), but all may well be Mid Upper Paleolithic or later in age.
Elsewhere in the Old World, eastern Asia has yielded the Tianyuan partial skeleton (Shang and Trinkaus, 2010) and secure dates for the incomplete Niah Cave remains (Brothwell, 1960; Barker et al., 2007), both about the same age as the Oase human remains. Slightly older in southeastern Asia is the Tam Pa Ling cranium (Shackelford et al., 2012), and the Liujiang partial skeleton may be as old (Wu and Poirier, 1995). In addition, southern Africa has provided the Hofmeyr partial cranium (Grine et al., 2007), also about the same age as the Oase humans. Other purportedly pre–30 ka 14C BP Interpleniiglacial modern human remains await confirmatory direct dating.

As a result, when the initial analyses of the Oase human remains were undertaken, the reasonably secure and meaningful comparative sample of European Early Upper Paleolithic (Aurignacian and Aurignacian time period) human remains consisted of isolated teeth from a number of sites (see list in Chapter 24) and the immature mandibles from Les Rois and La Quina Aval, plus the then more tenuously dated large sample from Mladeč. The comparative sample has expanded considerably since that time, principally through the direct dating of the more recent Cioclovina, La Crouzade, Mladeč, and Muierii remains. The Kent’s Cavern 4 maxilla, even if from broadly the same time interval as Oase 1 (Higham et al., 2011; see Chapter 19), serves only to suggest that modern humans spread as far as northwestern Europe in the same time period.

The Paleolithic Archeological Context

Of these Early Upper Paleolithic human remains, only the Brassempouy, La Quina Aval, and Les Rois samples, plus isolated teeth (see Chapter 24), are associated with diagnostic Aurignacian assemblages. The same probably applies to the assemblage originally associated with the La Crouzade human remains, little of which survives from the 1910s excavations (Henry-Gambier and Sacchi, 2008). The fragmentary Buran-Kaya 3 human remains are described as Gravettian-associated, despite a direct date of ~32 ka 14C BP (Prat et al., 2011), but this may reflect problems of assemblage definition rather than a regional precocity of the technocomplex, as the illustrated microliths seem to fall within the range of variation documented for the Aurignacian of the Crimea by the material from Siuren I (Otte, 2007). The associated Mladeč cultural assemblage consists of a dozen “Mladeč” points, plus 20 lithic pieces including one thick-nosed scraper, referred to by Oliva (2006) as the Middle or Late Aurignacian. The pollical phalanx from Layer VIII of Oblazowa Cave is associated with a lithic and ornament assemblage described as Early Pavlovian (Valde-Nowak, 2003), even though the three dates from Layer VIII (including the direct human one) are > 30 ka 14C BP. These are the more secure of the Aurignacian-associated early modern human remains from Europe.

The lithics that are probably from the same level as the Kent’s Cavern 4 maxilla are referable only to the Upper Paleolithic sensu lato (Jacobi et al., 2006). The three lithic elements normally associated with the Cioclovina cranium (Rainer and Simonescu, 1942; see Dobrescu, 2008) are undiagnostic and probably unassociated (Soficaru et al., 2007; Soficaru and Petrea, 2009). The Muierii human remains are the same age as a 14C-dated faunal sample associated (post hoc by stratigraphic depth in the Galeria Principă) with a small earlier Upper Paleolithic assemblage, but the human fossils were found in the separate Galeria Musteriană mixed with a redeposited Middle Paleolithic assemblage (Dobos et al., 2010); moreover, the Galeria Principă assemblage could hypotechnologically be attributed to either the late Aurignacian or the early Gravettian (cf. Păunescu, 2000).

From these considerations, it is apparent that diagnostic European human remains securely associated with Early Upper Paleolithic (Aurignacian sensu lato) are rare and principally from its later phases. The Oase human remains, possibly combined with the older age for the Kent’s Cavern 4 maxilla, should be sufficient to establish the presence of early modern humans across most of Europe by ~35 ka 14C BP, although the diagnosis of Kent’s Cavern 4 as “modern” is based on dental traits that are common among later modern humans and rare among the Neandertals and hence is a probabilistic statement. Even accepting Kent’s Cavern 4 as both modern and validly dated and, therefore, the spread of modern human biology from the Black Sea to the Irish Sea by ~35 ka 14C BP, this still leaves (1) no diagnostic modern human remains from the first 1500 years of the European Aurignacian and (2) no direct association of diagnostic modern humans with the Aurignacian until ~33 ka 14C BP, some 3500 radiocarbon years after its initial phase, the Protoaurignacian, is first recorded in Europe (Zilhão and d’Errico, 1999, 2003; Zilhão, 2006a, 2006c, 2007, 2011; Zilhão et al., 2007; Higham et al., 2009).

Interestingly, the preceding Initial Upper Paleolithic assemblages across Europe (and southwestern Asia) are largely devoid of diagnostic human remains. The principal ones are the Saint-Césaire skeleton and the Arcy-Renene fragments of Neandertals from the Châtelperronian levels of those sites (Lévêque and Vandermeersch, 1980; Lévêque et al., 1993; Hublin et al., 1996; Bailey and Hublin, 2006), plus the large Spy fossil collection directly dated to the same time period as the Lincombian–Ranisian–Jerzmanowician (Semal et al., 2009). There is a probably Neandertal molar associated with an Initial Upper Paleolithic assemblage at Lakonis (Harvati et al., 2003). And there are two undiagnostic (contra Anikovich
et al., 2007) isolated teeth from Kostenki. The two deciduous molar crowns from Uluzzian level E-III of Grotta del Cavallo have been taken to indicate that modern humans were present in Europe at this time (Benazzi et al., 2011), but their morphology is insufficient to establish that they are indeed from modern humans instead of Neandertals (cf. Churchill and Smith, 2000; Gambassini et al., 2005; Riel-Salvatore, 2009).

The Regional Archeological Context

The Oase 1 and 2 remains have no archeological context, and excavations to date in the Ponor-Plopa system (Băltean et al., 2008) have located no archeological remains of a similar age. Therefore, even if direct dating places them in the time range of the Aurignacian of central and western Europe, the question of the cultural-stratigraphical position of the Oase fossils needs to be addressed, particularly in the light of suggestions that the Romanian territory may have been idiosyncratic in this regard. For the southeastern Carpathians, for instance, a persistence of the Middle Paleolithic to ~30 ka ^14C BP if not beyond (Cârciumaru, 1999; Cârciumaru and Anghelinu, 2000) has been claimed, whereas an equally late persisting Szeletian-like entity (represented in levels IV–V of the Ripiceni-Izvor locality and often called Brynzenian) has been defined in northeastern Romania and Moldova (Kozłowski, 1995, 2000).

Bearing such claims in mind, the Oase fossils—and especially Oase 2, whose direct dating yielded a minimum age only—could conceivably be taken as corroborating a notion that goes back to Vallois’s (1949) pre-sapiens hypothesis, that modern humans were present in Europe well before the Aurignacian, even if perhaps in such small numbers as to go under the paleontological detection radar. Under such views, they could have been involved in the production of some Mousterian assemblage types (Bordes, 1972) or of the so-called transitional industries from central and eastern Europe. It is in this vein, for instance, that the authorship of the Bohunician has recently been assigned to modern humans by some (Bar-Yosef and Svoboda, 2003; Škrda, 2003a, 2003b; Tostevin, 2000, 2003), while others have used the date of emergence of that technocomplex, as recently established by both TL and radiocarbon at the type site of Brno-Bohunice (Richter et al., 2009), to set at ~45 ka ^14C BP (~48 ka cal BP) the date when modern humans first entered the continent (Müller et al., 2011). These views are largely based on typotechnological similarities to the southwest Asian “transitional” industries of Boker Tachtit, even though neither of these complexes has yielded any human remains, not even undiagnostic ones, and it assumes a human culture-biology equivalence that should have been long since rejected in paleoanthropology.

Over the last decade, however, it has become increasingly clear that the northeastern Romanian-Moldovan pattern is largely an artifact of palimpsest formation, postdepositional mixing, poorly dated samples, or dating samples with questionable stratigraphic relevance, coupled with issues of definition, namely, the mistaken identification of tool types or their misuse as absolute index fossils (for detailed reviews, see Noiret, 2004, 2009; Dobos et al., 2010; Anghelinu et al., 2012; Anghelinu and Niță, 2012). In fact, this fact region currently features a hiatus in archeological occurrences between ~45.5 ka ^14C BP, the minimum age recently obtained for level IV of Ripiceni-Izvor (whose affinities lie with the Middle Paleolithic, not the Szeletian), and ~32.5 ka ^14C BP, the age of the Evolved Aurignacian from Mitoc-Malu-Galben (Haesaerts et al., 2003; Dobos and Trinkaus, n.d.).

Where the southern Carpathians are concerned, the concept of an exceptionally late Middle Paleolithic rests entirely upon palynological climate matching coupled with radiocarbon dating evidence from samples whose association with the relevant stone tool assemblages is not always apparent (while the stone tools themselves are often undiagnostic to begin with). The dates come from three sites (Cârciumaru, 1999): Bordul Mare cave (Ohaba Poron), where a Mousterian occupation is sandwiched between dates of ~46 ka and ~29 ka ^14C BP; Gura Cheii cave (Rișnov), where the upper Mousterian is associated with dates between ~29 ka and ~30 ka ^14C BP; and Spurcată cave, where a Szeletian or Mousterian level would be dated to ~30 ka ^14C BP. However, the information on the nature and context of the samples concerned invites considerable reservation in the use of these results, as noted by Honea (1986) and Păunescu (2001:264, 297, 343).

At Bordul Mare, the ~29 ka ^14C BP result comes from a sample made up of bone fragments collected in the entire 30 cm of Upper Paleolithic level V, ascribed to the Aurignacian on the basis of a very small and undiagnostic artifact assemblage, while others have used the date of emergence of that technocomplex, as recently established by both TL and radiocarbon at the type site of Brno-Bohunice (Richter et al., 2009), to set at ~45 ka ^14C BP (~48 ka cal BP) the date when modern humans first entered the continent (Müller et al., 2011). These views are largely based on typotechnological similarities to the southwest Asian “transitional” industries of Boker Tachtit, even though neither of these complexes has yielded any human remains, not even undiagnostic ones, and it assumes a human culture-biology equivalence that should have been long since rejected in paleoanthropology.
and Doboš et al. (2010), it can thus be concluded that a persistence of the Middle Paleolithic beyond 42.5 ka cal BP in Romania, including the southern Carpathians, cannot be supported.

This conclusion is reinforced by the characteristics of a number of assemblages from undated open air sites in the Banat, ones of unambiguous Aurignacian nature. They correspond to the kind of material culture that one would expect to find in the time slot of the putative very late Middle Paleolithic of the country. These assemblages come from loess sites, originally excavated in the 1960s by Fl. Mogoșanu and since published in a more extensive fashion by Păunescu (2001), who provided information (site plans, stratigraphy, typological counts, and illustrations) sufficient to warrant the industrial diagnosis, otherwise corroborated by Aurignacian experts who have handled the material (e.g., Hahn, 1977; Teyssandier, 2008). Two of these sites, Seliște I (Tincova) and Dumbrăvița I (Româniști), are particularly relevant in that the material from the former’s single level is of Protoaurignacian affinities (Zilhão, 2006a), while the material from the latter’s level III (with 115 retouched tools, including 7 carinated scrapers, 5 Aurignacian blades, and 8 Dufour bladelets) is consistent with an attribution to the Aurignacian I (although not excluding the subsequent Aurignacian II).

The distance between these open air sites and Oase is no more than ~100 km. The Protoaurignacian is also recorded across the Danube, downstream of the Iron Gates, at the cave site of Kozarnika in Bulgaria (Sirakov et al., 2007). Given the probable size of hunter-gatherer territories and the geographic extents of their mating territories, coupled with the absence of major geographical or ecological barriers separating Oase from Tincova or Kozarnika, it is unlikely that the people who used these two settlement sites differed from the coeval groups to whom belonged the individuals whose remains ended up in the Oase bear bone accumulations. Put another way, in the absence of an immediate context, Tincova, Româniști, and Kozarnika suffice to establish that the cultural affinities of the Oase people are with the Aurignacian, not with the Middle Paleolithic (or with any of the transitional industries found in intermediate chronostratigraphic position).

**The Mortuary Issue**

The dearth of both Early and Initial Upper Paleolithic human remains raises the issue of the means of disposal of the dead during these time periods. Intentional burials are reasonably well-known during the Middle Paleolithic of western Eurasia, of both Neandertals and early modern humans (Tillier et al., 1988; Zilhão and Trinkaus, 2002b; Maureille and Vandermeersch, 2007; Pettitt, 2011). They are simple and rarely contain mortuary elaboration, but even eliminating the more questionable ones from the list provides a number of intentional interments. Similarly, in the western Eurasian Mid Upper Paleolithic, there are a number of intentional burials, some with extensive ornamentation and grave goods, and exhibiting a differential burial by age class, gender, and life experience (Zilhão and Trinkaus, 2002b; Zilhão, 2005; Formicola, 2007; Svoboda, 2008; Pettitt, 2011; Trinkaus and Buzhilova, 2011).

In contrast, the Initial and Early Upper Paleolithic possible burials are rare. The only secure Initial Upper Paleolithic burial seems to be Saint-Césaire 1, even though its excavation context does not preclude an earlier (Mousterian) or later (Aurignacian) age (Bar-Yosef and Bordes, 2010). If the Spy remains were buried (cf. Puydt and Lohest, 1887), then they would add to the sample. There are no Early Upper Paleolithic burials from Europe; all previously designated Aurignacian burials are Gravettian (Mid Upper Paleolithic) in age. There are two burials (with three individuals) from Nazlet Khater (Vermeeersch, 2002). The Tianyuan 1 partial skeleton was probably buried based on its preservation, but that cannot be confirmed (Fernández-Jalvo and Andrews, 2010). More tenuous are burials at Ksar Akil and Niah Cave.

At the same time, all of the Aurignacian-associated human remains (except from Mladeč) are fragmentary. It is assumed that the fragmentation and partial preservation, mostly of more durable teeth, was due to normal decomposition, scattering, and differential preservation. However, a portion of the Les Rois sample bears cut marks (Ramirez-Rossi et al., 2009), as does some of the Buran-Kaya III human sample (Prat et al., 2011) and, possibly, some human limb bones from Mladeč (Teschler-Nicola, 2006). Do these modifications represent a form of mortuary practice?

There is also the curious association of all of the more complete European Early Upper Paleolithic human remains with the deeper interiors of karstic caves. Oase 1 and 2, although clearly displaced within the Sala Mandibulei and Panta Strămoșilor, were somehow introduced into the cave, possibly through an opening from the sinkhole (dolina) adjacent to the Sala Mandibulei (Chapter 10). The Muierii human remains were discovered secondarily mixed with older Middle Paleolithic tools, at the back of the Galeria Musteriană of the Peștera Muierii, some distance from the entrance (Doboš et al., 2010). The original position of the Cioclovina cranium in the Peștera Cioclovina Ușcată is not known; the cave was principally a cave bear, wolf, and brown bear hibernaculum, and human activity was apparently rare and intermittent (Soficaru et al., 2007; Soficaru and Petrea, 2009). The largest and most complete sample of Aurignacian human remains is the one from the Mladeč Caves, originally preserving multiple crania, mandibles, teeth, and
various postcrania (Wolpoff et al., 2006a). At least those remains from the main chamber of the karstic cave system (the “Dome of the Dead”) appear to have been associated with a talus cone below a chimney in the small limestone massif. Given this accumulation, Svoboda (2000, 2006b) suggested that the human remains (and artifacts) accumulated there either incidentally to human activity on the surface above or through intentional deposition of the remains through a chimney or fissure.

In addition to these several examples of human skeletal accumulation in karstic systems, something known but rare in other Paleolithic periods (Svoboda, 2000), it is notable that none of the human remains from Cioclovina, Muierii or Oase exhibits carnivore damage. They all were variably broken and/or abraded, but none of them shows signs of carnivore punctures or gnawing. This is in the context of caves with an abundance of the remains of large carnivores (variably ursids, canids, hyaenids, and/or felids) and carnivore damage to herbivores and some of the carnivore remains (Soficaru et al., 2007; Dobos et al., 2010; see Chapters 12, 14, and 17). It is possible that some of these human remains were introduced into the caves at times distinct from the carnivore occupations. Yet the absence of such damage on the skull suggests processes other than predation being responsible for accumulating these human remains.

Several of the Mladeč postcranial remains, in contrast, exhibit damage patterns that are best interpreted as the products of carnivore scavenging (Teschler-Nicola, 2006). There is considerable evidence from the Mladeč large mammal remains of such carnivore activity (Pacher, 2006), but it is unclear when the carnivore damage to the human postcrania occurred relative to their introduction to the cave system.

Irrespective of the processes (human, geological, or faunal) involved in accumulating these human bones in these four caves, the absence of western Eurasian Early Upper Paleolithic burials, and their rarity in the Initial Upper Paleolithic, has produced a dearth of diagnostic human remains close to the transition between the latest Neandertals and the earliest modern humans in the region. It also suggests a contrast with the mortuary practices of preceding and succeeding human populations in the region. It is in this context that the Peștera cu Oase human remains take on significance for the establishment of modern human morphology in Europe.

**Beyond Population Processes**

Later Pleistocene paleoanthropology has been, and remains, largely focused on elucidating the complex human populational processes that were involved in the emergence and establishment of modern human biology. These concerns have been interwoven with assessments of the nature, definition, identification, and distribution of archeological reflections of what some refer to as “modern human behavior.” In human biology, the discussion has largely shifted from the dichotomic opposition between regional continuity of human populations versus replacement by modern humans coming from elsewhere (although population continuity must have occurred somewhere). It is now generally recognized that reality probably lay somewhere in between these extreme positions.

Based on the human fossils and their chronology, modern human biology first emerged in eastern Africa in the later Middle Pleistocene (MIS 6) (as documented by the remains from Herto and Omo-Kibish), spread into southern Asia during MIS 5c, at least in southwestern Asia (Qafzeh and Skhul) and southeastern Asia (Zhihengdong), but then became fully established across the Old World only in the Interpleniiglacial (MIS 3). Accumulating evidence from human paleontology (cf. Smith et al., 2005; Trinkaus, 2005b, 2007; Cartmill and Smith, 2009) has indicated that the process was one of Assimilation (Smith et al., 1989a), whereby some modest percentage of the regional late archaic human populations were absorbed genetically into the expanding populations of morphologically modern humans. The modest degree of absorption is indicated by the predominantly derived modern human morphology of those early modern humans, whether identified across Eurasia or in Africa outside of the east African core area. The assimilation pattern is reflected in the presence, among post-40 ka BP modern humans, of a variety of archaic features lost in the earlier MIS 6 to 5 modern humans and/or derived Neandertal features (cf. Trinkaus and Zilhão, 2002; Trinkaus, 2007). These inferences have been echoed in more recent analyses of ancient DNA (Green et al., 2010; Reich et al., 2010).

The persistent arguments regarding these population processes concern partly the degree of assimilation (admixture, gene flow) that took place when regional late archaic humans were absorbed into expanding modern human populations. As noted, it was probably modest, and more precise calculations are meaningless, whether derived from morphological or molecular data, given all of the unverifiable demographic, selective, and stochastic assumptions that go into any such calculation. The other discussions concern whether the traits, morphological or molecular, used as evidence of such admixture are indeed homologous. Many of the challenges to homology are aimed at identifying the Neandertal configuration as highly derived, a tradition that goes back a century to Boule (1911–13; see Trinkaus, 2006a). Others aim to find the Neandertal trait in a MIS 6–5 modern human, however rare, losing the perspective that very few of the purported...
Neandertal traits are likely to be unique to them or that all Neandertals will express them.

As a consequence, there is emerging less interest in the phylogenetic issues per se, or who was having sex with whom in the Late Pleistocene, although these issues will probably never die. There appears to be more concern with sorting out the paleobiology of late archaic versus early modern humans. Some of this paleobiological concern is still focused on identifying uniquely derived aspects of the Neandertals, with an eye to make them less attractive as (even minor) ancestors. But some of it is also concerned with understanding the functional and behavioral implications of the biological differences, albeit in the context of viable, nonpathological populations (contra Green et al., 2010). It is in this context that the morphology of the Oase human remains have meaning.

**The Morphological Mosaic of the Oase Humans**

The detailed discussions of the morphological patterns evident in Oase 1 and 2 (Chapters 20 to 24) highlight two aspects. First, these are unquestionably morphologically modern humans in the sense of exhibiting a long suite of derived modern human characteristics (sensu Trinkaus, 2006a). Second, both fossils possess a series of morphological configurations, including wide mandibular rami, mandibular foramen bridging (the horizontal-oval form), the rotation of the facial skeleton on the neurocranium and the consequently low and long frontal profile, the unusual if basically modern labyrinthine arrangement, the very broad palate, the long anterior tooth roots of Oase 2, the exceptionally large distal molars of both individuals, the M3 complexity of Oase 2, the progressively larger distal molars, and the combinations of these features plus derived modern human ones in one or the other of these individuals. Other aspects are normal for modern humans but appear unusual in combination, including the gracile corpus yet wide rami of Oase 1, and the large face yet small mastoid process and very gracile occipital bone of Oase 2.

Several of these features can be, and have been, employed to argue that some of the ancestry of the Oase humans was other than among Middle Paleolithic modern human populations such as those represented by the Near Eastern interglacial samples of Qafzeh and Skhul. This may well be one of the implications of their morphological mosaic. But the other implication is that there is a process of anatomical development and integration represented here that is different from earlier modern humans, preceding late archaic humans, and subsequent populations of ourselves. Yet these were viable individuals, who lived well into or through their second decades of life, with no obvious skeletal or dental abnormalities. They are not pathological. Are these exceptional morphological aspects the result of mixed ancestry producing unique combinations of characteristics? How might they relate to subsequent modern human samples from the Early and Mid Upper Paleolithic, who are more morphologically modern even though many of them also exhibit a variety of archaic or Neandertal features (Trinkaus and Zilhão, 2002; Frayer et al., 2006; Wolpoff et al., 2006b; Trinkaus, 2007, 2011; Ramirez-Rossi et al., 2009)? What does it mean to be “modern” without being fully modern?

Therefore, these morphological mosaics of the Oase fossils raise the issue of what it means to be anatomically modern. It is possible to identify a series of uniquely derived (autapomorphic) characteristics of recent humans and of Neandertals as well as ancestral (pleiomorphic) features (cf. Trinkaus, 2006a; Cartmill and Smith, 2009), something that has been done for the past century, since Boule (1911–13), despite the limitations and potential tautological nature of such cladistic approaches (Trinkaus, 1990). However, those lists are based on our perceptions of recent (Holocene) humans compared with classic (MIS 4–3 western European) Neandertals, with an outside reference of Early and earlier Middle Pleistocene Homo (H. erectus sensu lato) fossils providing the ancestral pattern. Yet past populations were not static types with limited ranges of variation, especially since the biological variation was distributed over both space (as among Holocene humans) and tens of millennia of time.

It is convenient, and has been done here (see Chapters 20 to 25), to categorize fossils into working samples (operational taxonomic units, or OTUs), based largely on their combinations of ancestral and derived features and the predominant ones present in the specimens and samples. However, there are always ambiguous cases.

Among the Middle Paleolithic modern humans (see Chapters 20 and 21), most of the Qafzeh and Skhul specimens are clearly modern, but Skhul 9 is more ambiguously so (McCown and Keith, 1939; Corruggini, 1992). Omo-Kibish 1 is distinctly modern, but Omo-Kibish 2 has been separated out as archaic (e.g., Day and Stringer, 1982; Bräuer, 2008). Herto 5, despite being immature, is distinctly modern in its preserved portions, but the adult Herto 1 cranium is rather archaic (if non-Neandertal) (White et al., 2003). The Zhiren 3 mandible has a derived, modern human anterior symphysis, but the corpus is robust and its symphyseal cross sectional shape falls among more archaic humans (Liu et al., 2010). And the probably later Middle Pleistocene Loiyangalani 1 mandible and maxilla present derived modern features, especially in the nasal aperture and the anterior symphysis, but the mandible is massively robust and has a ramal morphology reminiscent of earlier Middle Pleistocene humans (Muteti et al., 2010). Are these exceptional cases, or are they reflecting the original transition between late archaic and early
modern humans in east Africa and southern Asia? Or is our archaic–modern dichotomy too conceptually rigid?

**What Does It Mean To Be Aurignacian?**

When seen in the perspective of recent developments, the morphological mosaic of Oase 1 and 2, especially when combined with that present in the Kent’s Cavern 4 teeth and in the Mladěč, Muierii, and Les Rois samples (Frayer et al., 2006; Ramírez-Rossi et al., 2009; Doboș et al., 2010; Higham et al., 2011; Trinkaus, 2013), plus the multiple aspects of nonmodern morphology in a variety of Mid Upper Paleolithic human remains (Smith et al., 1988b; Frayer, 1992; Trinkaus and Zilhão, 2002; Trinkaus, 2007, 2011), is not so unusual. As noted already in this chapter and elsewhere, it may well have populational implications. Yet these mosaics also raise the question of whether the modern versus archaic dichotomy, the validity of which is unquestionable in a long-term, evolutionary perspective, remains useful when assessing patterns and processes on a short-term historical perspective. This concerns not just the morphology of the people involved but their culture as well.

With current evidence, models of the emergence of modern human anatomy that assume total continuity, with gene flow across neighborhood networks as the single mechanism at work in the process, are unrealistic. As in the historical and ethnographic records, uneven development leading to contact between human groups differing in culture, language, and phenotype must have been a feature of the past history of our lineage. Such contact situations always entail some form of exchange, even though the corresponding evidence may not be amenable to survival in the archeological or paleontological records. Indeed, even supporters of complete replacement and the Neandertals’ species distinctiveness have for the past quarter of a century used acculturation by incoming modern humans to explain the presence of objects of personal ornamentation and decorated bone tools in a number of Initial Upper Paleolithic contexts of eastern, central, and western Europe presumed to be Neandertal-associated (Hublin, 2000). Recent finds, however, extend personal ornamentation in Europe back to at least 50 ka cal BP; well into the unambiguously Neandertal-associated Middle Paleolithic. Cueva de los Aviones (Spain) yielded cosmetic pigments and perforated/ochred marine shells (Zilhão et al., 2010). At Pech de l’Azé (France), the use of manganese dioxide crayons for body painting (Bordes, 1952) was verified by use-wear analysis and experimental replication (Soressi and d’Errico, 2007). Complete palettes for the processing of ochre have been documented at the Ciocănei Cave (Romania) (Cârciumaru and Țuțuianu-Cârciumaru, 2009), and such pigment use extends back to the late Middle Pleistocene in northern Europe (Roebroeks et al., 2012). And, at Fumane (Italy), cut-marked wing bones of large birds of prey indicate the collection of their feathers for body decoration (Peresani et al., 2011).

In this framework, the presence in the Aurignacian of ornament types found in preceding cultures of Europe but unknown in coeval or earlier modern human-associated contexts from Africa and the Near East indicates that significant levels of cultural exchange took place as part of the Assimilation process. In this case, the pattern implies the persistence of Neandertal traditions of personal ornamentation into the culture of the earliest European modern humans. But, if such significant aspects of material culture were transmitted across the Middle-to-Upper Paleolithic transition (henceforth, the Transition), it is unlikely that the process was unidirectional, from Neandertals-to-modern humans only or vice versa. In the case of personal ornamentation, the diagnosis is facilitated by the long-term stability of traditions (Stiner, 1999). Other aspects of the material culture record of the period, however, are less amenable to interpretation in terms of “where does it come from,” because the pace of change was much faster. This is the case with lithic technology, whose rapid transformation between the latest Middle Paleolithic and the earliest Aurignacian is precisely what underpins the recognition of the period as transitional. In this realm, change from one state to another was frequent and, more to the point, involved choosing between alternative ways of doing things that admit no intermediate conditions—it’s one or the other. Therefore, although some individuals may stick to the old ways through the short period of days, weeks, years, or at most a few generations during which the new ways are introduced and tested, social constraints, namely, those of learning, will quickly select one alternative as the norm. As the time frames involved are so short that, archeologically, the changes will almost inevitably be perceived as momentaneous/momentous events, addressing the nature of the culture process by which such changes occur is fraught with issues of equifinality.

The emergence of the Aurignacian provides a good illustration of this general problem. As shown by the Oase fossils, it broadly coincides with the earliest evidence for the presence of modern humans in Europe, and its technological homogeneity across vast expanses of geography, from Asturias in the West to the Zagros in the East, contrasts with the spatially restricted distributions of the different transitional technocomplexes of the preceding Initial Upper Paleolithic. This coincidence indicates that some process of major populational significance underlies the emergence of the Aurignacian. Under the assumption that “the Aurignacian was exclusively
made by modern humans because only modern humans had the cognitive capabilities required by Aurignacian-ness,” it is all too natural that the process will be seen as the migration of a people that establishes its phenotype (anatomical modernity) and culture (the behaviorally “modern” Aurignacian) as it advances across the continent. However, if we part company with that assumption (as we must, given the evidence for Middle Paleolithic personal ornamentation), establishing the exact nature of the process is not straightforward. As more extensively discussed elsewhere (Zilhão, 2006c), at least three main families of explanations, with variants, can be invoked to account for the observed patterns:

- The Aurignacian could be a technology developed by modern human groups once they start to disperse into Europe; it prevailed among the mixed populations resulting from contact with local Neandertals, and, as the assimilation zone moved westward, the Aurignacian spread with it, its first appearance in the archeological record of a given region representing a proxy for the passing-through of that zone.
- The Aurignacian could have been invented somewhere in western Asia and in an anatomically modern milieu, prior to the expansion of modern human groups into Europe; acquired by neighboring Neandertal groups, the innovations for which it stands would then have rapidly diffused westward, and the first groups of anatomically modern people dispersing into Europe would have encountered Neandertal populations that, culturally, were Aurignacian too.
- The Aurignacian could have been invented in Europe by Neandertals just before modern human groups started to disperse into the continent; as this technology was advantageous, modern human groups adopted it in the framework of the processes of population interaction and admixture occurring at the time of contact and, through their own alliance and exchange networks, diffused it eastward to Asia.

Although the real situation on the ground must have been rather more complex, these examples at least serve to illustrate three points: (1) that cultural innovations can spread much faster than people can migrate, and especially so in the case of technological breakthroughs having the potential to bring about significant advantages; (2) that over a continuously occupied expanse of territory, even if population densities were as low as has been documented in the ethnographic record of the Arctic, diffusion could have occurred from one end of the Aurignacian geography to the other in at most a few generations, whereas the minimum amount of time that archeological stratigraphies and chronometric dating techniques allow us to resolve is in the order of the millennium; and (3) that, bearing in mind what happened in the realm of personal ornamentation, one must expect cultural transmission phenomena to have been involved in the shaping of other aspects of the archeology of the Transition, namely, where bone and stone tools are concerned, and that such transmission is rather more likely to have been bidirectional than unidirectional.

The Middle-to-Upper Paleolithic Transition as a Biocultural Mosaic

In this regard, recent developments in the study of Châtelperronian technology have ponderous consequences. Pellegrin’s (1995) seminal study had already shown that the technocomplex featured deliberate bladelet production, and this conclusion is now corroborated by refitting work carried out at a number of single-level, open-air sites whose lithic taphonomic analysis excludes intrusion as an explanation for the corresponding evidence (Bachelerie, 2011). These results are further supported by the consistent presence of bladelet cores and bladelet-sized blanks across all levels of the Quinçay sequence (Roussel, 2011), where intrusion from overlying Aurignacian levels is precluded by their absence (and the Châtelperronian levels are sealed by collapsed slabs several meters long and tens of centimeters thick). At this latter site, in addition, a substantial number of bladelets (30, or 2.5% of the 1181 retouched tools from the three levels) bear a marginal, inverse retouch typical for the Dufour subtype of Dufour bladelets, characteristic of the Protoaurignacian (the earliest phase of the Aurignacian); the bladelet cores from where they were extracted, however, are reduced in Châtelperronian rather than Protoaurignacian fashion.

These patterns must be interpreted against the fact that, as pointed out by Bordes (2002), the systems used in the Châtelperronian and the Protoaurignacian to produce laminar blanks, either blade- or bladelet-sized, have a number of features in common, and certainly resemble each other more than they do those of the subsequent Aurignacian I. Such a resemblance may be taken to suggest acculturation either in the traditional sense of Hublin (2000), as favored by Roussel (2011), or in the reverse direction, as favored by Bordes (2002) and supported by the chronometric and stratigraphic evidence. More importantly, this evidence goes to show that the same issues of equifinality involved in the interpretation of the emergence of the Aurignacian may apply to the preceding technocomplexes of the Initial Upper Paleolithic. This is
all the more so if, as argued by Rebollo et al. (2011; contra cf. Zilhão, 2006b, 2007), the Ahmarián, instead of being the Near Eastern equivalent of the Protoaurignacian, emerged significantly earlier, at broadly the same time as the Châtelperronian of western Europe.

Against this archeological background, the fragmentary nature of the Transition’s human fossil record further complicates the issue, because it makes it unlikely that, for a significant proportion of the material, a single solution for the taxonomic affinities equation can be chosen from among the many possible ones: namely “modern” versus “Neandertal” versus “modern individual with Neandertal traits” versus “Neandertal individual with modern traits.” Moreover, one could have “dental or skeletal part of modern affinities that, however, is known to occur with such characteristics in more complete fossils that are clearly Neandertal overall” versus “dental or skeletal part of Neandertal affinities that, however, is known to occur with such characteristics in more complete fossils that are clearly modern overall.”

Probing this material for ever more specific and minute criteria to resolve the ambiguous cases into a clear Neandertal versus modern dichotomy is an ongoing research strategy. Under the assumption that the dichotomy is real and the fuzzyness relates to the patchiness of the record and the shortcomings of current methods, this approach makes sense, and especially so under models of a Neandertals’ distinctiveness that require archeological proof of modern human superiority in cognition, technology and social behavior upon which to hang explanations of the outcome of contact in terms of competition for territory and resources. However, the last decade has provided sufficient evidence that the fuzzyness resides in past reality, not in present perceptions of it. The growing fossil record outside of Europe and the apparent primary region of modern human emergence (east Africa) provides the same kind of complex morphological mosaic (Trinkaus, 2005a; Liu et al., 2010; Shang and Trinkaus, 2010) as is evident in western Eurasia. Moreover, the genetic analysis of living humans supports the inference that admixture between modern and archaic peoples occurred with such characteristics in more complete fossils that are clearly Neandertal overall” versus “dental or skeletal part of Neandertal affinities that, however, is known to occur with such characteristics in more complete fossils that are clearly modern overall.”

In addition, from the empirical side of things, typological approaches to this variability may well be beyond the reach of scientific inquiry, given that rejecting the alternative requires a number of stringent conditions. These are, namely, (1) that human remains are found in direct association with each of the cultural entities of the Transition and not just in one particular region but across the entire geographic span of each, and (2) that relatively complete paleontological (and archeological) diagnostic morphology is available in all of the cases of association.

The morphological, cultural, and genetic mosaics apparent or inferred in the European Transition thus cast doubt on the possibility that technocomplexes and human biology can be consistently correlated. The correlation may exist but needs to be demonstrated rather than assumed, and the demonstration may not always be possible. The fact that, after 150 years of research, securely dated and diagnostic modern human fossils older than ~35 ka 14C BP (~40.5 ka cal BP) remain to be found in Europe does not exclude that significant levels of genetic and cultural flow with the Near East and North Africa were already in existence prior to that time. It does not preclude either that such long-distance interaction contributed to change in the biology and culture of the later Neandertals ahead of any actual dispersal of distinctive modern human groups into the continent. But it does make it highly unlikely that the transitional technocomplexes of Europe whose emergence predates ~35 ka 14C BP by several millennia were the work of anyone other than Neandertals. Where the Aurignacian is concerned, however, the situation is rather more complicated, as a thought experiment involving the Oase fossils well illustrates.

The best statistical tool currently available to sort out Neandertals from modern humans on the basis of tooth morphology classified Oase 1 as principally modern and Oase 2 as principally Neandertal (Bailey et al., 2009). Given this result, what would have happened if Oase 2, instead of having been preserved as a nearly complete cranium, had come to our knowledge reduced to its maxillary teeth? Here, we proposed for these fossils a populational interpretation—the two Oase individuals representing the kinds of mosaics to be expected down the line, several generations after the Assimilation process was set in motion. In the framework of the thought experiment, however, Oase 1 would have to be classified as a modern human and Oase 2 as a Neandertal, and legitimate, alternative interpretations would be that (1) “pure” Neandertals and “pure” moderns lived side by side in the Banat at the time of the Aurignacian, (2) the Oase karst had sampled that glimpse of time during which “pure” Neandertals and “pure” moderns could be found together in a single social unit, or (3) Neandertals should be counted among the makers of the Aurignacian (given their persistence into the time range of the technocomplex in Romania). The same kind of thought experiment could be made with reference to the bladelets of the Châtelperronian versus the Protoaurignacian already discussed.
Fortunately, Oase 2 is more than just a maxilla, but the thought experiment shows why we must ask ourselves whether it remains productive to frame the study of the Transition in terms of Neandertals, modern humans, and their putative technocomplex associations. It also highlights the dangers of assigning fossil human specimens, or archeological assemblages, to one or another of these typological frameworks solely on the basis of limited information. In the long-term, evolutionary perspective, it is clear that, in Europe, the process begins with Mousterian Neandertals and ends, some 10 millennia later, with Aurignacian modern humans. But, in the historical perspective, 10 millennia is not a blip, and reifying the outcome of long-term evolution as an event with explanatory power to the understanding of that outcome itself does not seem a very clever, or useful, way to make progress in the interpretation of the past.

Archeologists have long recognized this problem (albeit, quite possibly, in a subconscious way only) and dealt with it by creating the category “transitional” to refer to the European technocomplexes at the interface between the unambiguously Middle Paleolithic Mousterian/Micoquian and the unambiguously Upper Paleolithic Aurignacian. Much as the fossils of the earliest European modern humans are “modern” without being fully modern, most of these technocomplexes are “Upper Paleolithic” without being fully Upper Paleolithic. For instance, the Bachokirian of Bulgaria features a typology dominated by endscrapers and points made on laminar blanks that are obtained by Levallois, not prismatic reduction (Teyssandier, 2008). And the Uluzzian of Italy and Greece, although characterized by endscrapers, microlithic segments, and bone tools, is a flake-based industry featuring cores exploited by bipolar or orthogonal débitage with unprepared striking platforms (d’Errico et al., 2011).

Perhaps the lesson from Oase and coeval fossils is that the time has come for human paleontologists to acknowledge that a similar category of transitional fossils should be created to accommodate the human remains from the period when they all seem to be “Neandertal” without being fully Neandertal, “modern” without being fully modern, or somewhere in between. Can we move beyond the categories of “modern” and “archaic,” albeit with messy edges, or do we remain with the early 20th-century conceptions of Cro-Magnon and Neandertal?

**Conclusion**

Associating the Châtelperronian with either Neandertals or moderns, and whether the Aurignacian was exclusively modern human-associated, are research questions of the 20th century. Identifying with precision the authors of a particular cultural manifestation will certainly add color, and not solely in the racial sense of the expression, to any historical reconstruction of the events and processes that shaped or constituted the Transition. Even if still pertinent in that sense, such an identification, however, can no longer be seen as providing, in and of itself, the ultimate explanation (in terms of biologically based capabilities and the corresponding behaviors) for the observed patterns—the current empirical record is simply inconsistent with such reductionist interpretations. Instead, the evidence suggests that the western Eurasian Transition relates to a complex feedback mechanism driven by technology, demography, and social processes, in which (1) different alternatives to the same problem (how to make more efficient hunting weapons) are successively experimented with until one (the Aurignacian) is eventually fixed, and (2) population increase makes for more intense contact with African populations previously separated by ecogeographical boundaries across which biocultural change was limited, leading to effective transcontinental fusion in a single gene reservoir, with attendant phenotypical implications.

Against this background, we see the relevant questions lying ahead of us as being rather different from those that dominated the first 150 years of Neandertal/modern human research. For instance, why are archeologically visible symbols of personal or social identification absent from the archeological record prior to 100,000 years ago, tens of thousands of years after the onset of the morphological transition to modernity in at least eastern Africa? Why, when they begin to appear, is the pattern that we get one of intermittent appearance (“now you see it, now you don’t”; Hovers and Belfer-Cohen, 2006), and this as much in Africa as across Eurasia? In what way do these developments, as well as those occurring at the same time in the technological realm, relate to the Robusticity Transition in human morphology? And how, and why, did that transition vary, if it did, across space in both rhythm and mode? To what extent do synchronic differences in skeletal anatomy reflect adjustments to contrasting environments and to what extent does diachronic change through time reflect increased cultural buffering against such external constraints? And, once the archeological record becomes rich enough for the question to be asked, to what extent are the indications of exchange and diffusion amenable to interpretation in terms of the social categories observed among ethnographic hunter-gatherers?

By placing individuals of overall modern anatomy combined with archaic features in the chronological range of the earlier Aurignacian, the Oase fossils have shown us how the transitional people of the Transition looked

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like at one particular turn of the period’s time/space configuration. As such, they shed light on the nature of the processes that shaped previous phases of the Transition and provide models to interpret what was going on elsewhere at about the same time. This is significant, but we would hope that their more enduring contribution resides in having helped us all (ourselves included), so used to framing questions in terms of discrete categories, to phrase them more in terms of the complex dynamics of what it means to be Neandertal or modern, Middle Paleolithic or Upper Paleolithic, without being either one of each term of these dichotomies.
Part Seven

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