

The Middle-Upper Paleolithic Transition Revisited

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Abstract The transition from tool industries traditionally seen as Middle Paleolithic to those perceived as Upper Paleolithic has for decades been assumed to coincide chronologically with the ‘replacement’ in Europe of the resident ‘Neanderthals’ by ‘invading’ ‘anatomically modern people’ from Africa. The basis of this belief is critically examined in view of recent developments in the dating of hominin remains in Europe, and in the exposure of fake datings of several key specimens. It is shown that there is no comprehensive evidence that any of the Early Upper Paleolithic traditions were introduced by fully modern hominins, but that there was instead a gradual process of gracilization rather than outright replacement evident in the fossil record. The same is shown to occur with tool industries and paleoart production, which develop progressively and gradually. The gradual change from robust to gracile skeletal architecture is not limited to Europe; it is a feature of all four continents occupied by humans 50,000 years ago. If the Aurignacian rock art and portable art in Europe is by robusts, such as Neanderthaloids, which appears to be the case, the various versions of the African Eve hypothesis must be considered to be refuted decisively.

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More than a decade ago I pointed out that we have no evidence whatsoever that the Early Aurignacian is the work of ‘Moderns’ (Bednarik 1995), to which I can now add that we have no proof of a ‘physically

modern’ morphology of the makers of *any tool tradition of the entire first half of the so-called Upper Paleolithic*—including the entire Aurignacian. The search for physical modernity is itself misguided (Tobias 1995); modernity is indicated by cognition and culture, and more specifically by the external storage of cultural information (Donald 1993). The present archaeological and paleoanthropological evidence suggests that we have Neanderthaloid remains from the time interval in question, and we have no securely provenanced ‘Moderns.’ European Pleistocene archaeologists are obliged to consider the possibility that the Aurignacian is the work either of ‘Neanderthals’ or of their descendants who experienced genetic drift rather than ‘replacement.’ Science works by falsification, and the proposition to be tested now is that Aurignacian ‘art,’ like Châtelperronian ‘art,’ *was created not by ‘Moderns.’*

The replacement model has depended greatly on a series of ‘anatomically modern’ hominin specimens from across Europe, especially central Europe, all of which have been severely misdated. A case in point is the Vogelherd skull (Stetten I): anyone who has actually examined it will have been struck by its modern appearance, both anatomically and in terms of its preservation (Fig. 1). That is precisely why careful commentators warned that ‘judging by its appearance it would fit much better into a late phase of the Neolithic’ (Czarnetzki 1983, 231). Gieseler (1974) had expressed similar concerns about Stetten II, a cranial fragment, and others also favoured an attribution to the site’s Neolithic occupation. The putative age of the Stetten specimens, 32 ka, now stands refuted by their direct dating to

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Fig. 1 Stetten I, claimed by replacement advocates to be 32,000 years old. It is in fact Neolithic

the late Neolithic period (Conard et al. 2004), confirming the obvious: that they are intrusive burials. Direct carbon isotope determinations of samples taken from the mandible of Stetten 1, the cranium of Stetten 2, a humerus of Stetten 3, and a vertebra of Stetten 4 all agree, falling between 3980 ± 35 BP and 4995 ± 35 BP. Contrary to Churchill and Smith (2000a), the Stetten specimens tell us therefore nothing about the skeletal anatomy of the ‘Aurignacians.’

The Hahnöfersand calvarium, described as so robust that it was judged to show typical Neanderthal features (Bräuer 1980), was initially dated to the earliest ‘Upper Paleolithic’ (Fra-24: $36,300 \pm 600$ BP; UCLA-2363: $35,000 \pm 2000$ BP, or $33,200 \pm 2990$ BP; Bräuer 1980). These results conflict sharply with those now secured by Terberger and Street (2003): P-11493: 7470 ± 100 BP; OxA-10306: 7500 ± 55 BP. The redating of the skull fragment from Paderborn-Sande yielded even more dramatic differences. Originally dated at $27,400 \pm 600$ BP (Fra-15; Henke and Protsch 1978), Terberger and Street (2003) report an age of only 238 ± 39 BP (OxA-9879). Then there is the cranial fragment of Binshof near Speyer, dated by R. Protsch in the 1970s as Fra-40 to $21,300 \pm 320$ BP. According to Terberger and Street it is only 3090 ± 45 carbon years old (OxA-9880). These authors also analyzed two individuals from the Urdhöhle near Döbritz, which had been attributed to the Upper Paleolithic, and

found them both to be about 8400 years old. The skull from Kelsterbach had been dated to $31,200 \pm 1600$ BP (Fra-5) (Protsch and Semmel 1978; Henke and Rothe 1994), but has mysteriously disappeared. It is now also believed to be of the Holocene, perhaps the Metal Ages (Terberger and Street 2003). Indeed, because of the fake datings by Protsch (Schulz 2004), of all the German ‘Upper Paleolithic’ specimens, only one remains safely dated to earlier than 13,000 BP, from Mittlere Klause in Bavaria. A carbon isotope date of $18,200 \pm 200$ BP (UCLA-1869) from a tibia fragment (Protsch and Glowatzki 1974) has been confirmed by Terberger and Street’s date from a vertebra, of $18,590 \pm 260$ BP (OxA-9856). It has therefore become clear that there are currently no ‘modern’ remains from the first two-thirds of the west central European Upper Paleolithic.

Similarly, the sample from Crô-Magnon in France, traditionally regarded as typical representatives of invading Moderns in Europe, has been falsely attributed. Sonneville-Bordes (1959) placed the four adults and three or four juveniles in the late Aurignacian; Movius (1969) suggested an age of about 30 ka BP and preferred an attribution to the Aurignacian 2 (Fig. 2). Excavation was *careless*, with iron tool marks found on the adult remains. The recent redating to about 27,760 carbon years BP (Henry-Gambier 2002) renders previous opinions invalid, and the remains are probably of the Gravettian, i.e., the ‘culture’ that succeeded the Aurignacian. Moreover, the very pronounced supraorbital torus, projecting occipital bone, and other features of cranium 3 are Neanderthaloid rather than gracile. This and other aspects of the generally somewhat robust Crô-Magnon series question the full ‘modernity’ of the group—but irrespective of this, it tells us also nothing about the anatomy of the ‘Aurignacians.’

Similarly tenuous are the identical claims for the Mladeč specimens from the Czech Republic. It is uncertain that the cave was even accessible to Upper Paleolithic humans; their remains may have entered the cave via a vertical shaft from above. The site was entirely bereft of archaeological strata by the time systematic excavations were developed, and little is known about its archaeology (Jelínek 1987; Bednarik 2006). Recent attempts to provide direct dates from some of the human

Fig. 2 One of the Crô-Magnon specimens, attributed to the Aurignacian, is in fact of the Gravettian

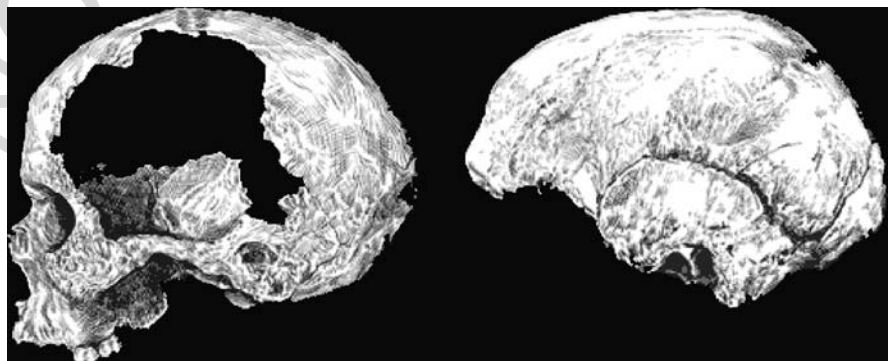


remains (Wild et al. 2005) yielded five results ranging from about 26,330 to 31,500 BP. The fossils are therefore at best from the latest part of the Aurignacian period (45 ka to 30 ka BP), but also point to a possible Gravettian age. Moreover, there is considerable evidence that the Mladeč humans were far from fully ‘modern’ (Frayer 1986; Smith 1982, 1985; Trinkaus and Le May 1982). Sexual dimorphism is pronounced, with male crania being very robust. The female specimens show similarities with, as well as differences from, accepted Neanderthal females (Fig. 3). The Mladeč population thus seems to occupy an intermediate position between late Neanderthaloid *Homo sapiens*, and *H. sapiens sapiens*, a position it shares with numerous human remains from other Czech sites. The material from Pavlov Hill is among the most robust available from the European Upper Paleolithic, sharing its age of between 26 and 27 ka with yet another

Moravian site of the Gravettian, Předmostí. The more gracile finds from Dolní Vestonice are around 25 ka old and still feature some archaic characteristics (particularly the Neanderthaloid specimen DV16). Morphologically similar specimens also come from Cioclovina (Romania), Bacho Kiro levels 6/7 (Bulgaria), and Miesslingtal (Austria), so this is unlikely to be a local phenomenon.

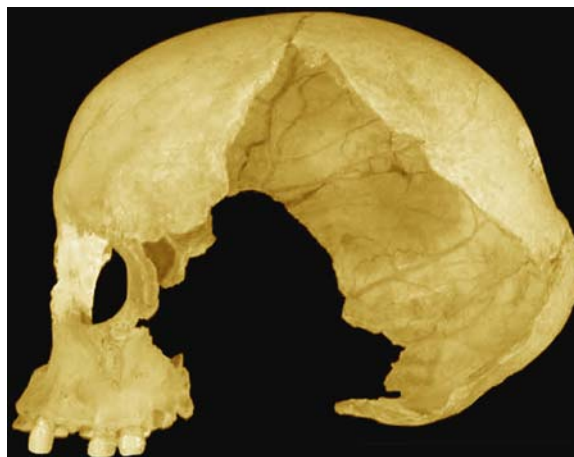
Other specimens that have been considered as very early European Moderns include the calotte from Podbaba, near Prague, variously described as sapienoid and Neanderthaloid, but undated; it probably belongs to the Mladeč-Předmostí-Pavlov-Dolní Vestonice spectrum. Then there are the robust but ‘modern’ hominid remains of the EUP (early ‘Upper Paleolithic’) at Velika Pećina, Croatia, close to the Neanderthal site Vindija. This specimen has also been a principal support for the replacement advocates, but it too has joined the long list of

Fig. 3 Mladeč 1, a gracile female (*left*) and Mladeč 5, a robust male (*right*), c. 30,000 BP



295 European humans whose age was grossly overesti-
 296 mated. It is now considered to be only 5045 ± 40
 297 carbon years old (OxA-8294; Smith et al. 1999).

298 The loss of the only relevant Spanish remains,
 299 from El Castillo and apparently of the very early
 300 Aurignacian, renders it impossible to determine
 301 their anatomy. French contenders for EUP age pre-
 302 sent a mosaic of unreliable provenience or uncertain
 303 age, and direct dating is mostly not available. Like
 304 the Vogelherd and other specimens, those from
 305 Roche-Courbon (Geay 1957), La Rochette, Bouil
 306 Bleu, and Combe-Capelle (originally attributed to
 307 the Châtelperronian levels; Klaatsch and Hauser
 308 1910) are thought to be of Holocene burials
 309 (Asmus 1964; Foucher et al. 1995; Perpère 1971),
 310 and the first-mentioned is now apparently lost.
 311 Similar considerations apply to the partial skeleton
 312 from Les Cottés, whose stratigraphical position
 313 could not be ascertained (Perpère 1973). Finds
 314 from La Quina, La Chaise de Vouthon, and Les
 315 Roches are too fragmentary to provide diagnostic
 316 details. The *os frontale* and fragmentary right max-
 317 illa with four teeth from La Crouzade, the mandible
 318 fragment from Isturitz, and the two juvenile mand-
 319 ibles from Les Rois range from robust to very
 320 robust. The Fontéchevade parietal bone does
 321 lack prominent tori but the site's juvenile man-
 322 dibular fragment is robust. The currently earliest
 323 'intermediate' finds in Europe, the Peștera cu Oase
 324 mandible and separate face (Fig. 4) from south-
 325 western Romania (Trinkaus et al. 2003), are per-
 326 haps about 35,000 carbon years old, but they are
 327 without an archaeological context and certainly



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Fig. 5 Peștera Muierii skull combining robust and gracile
 358 features, c. 30,000 BP

359 not anatomically modern. 'Derived Neanderthal
 360 features' identify these remains as post-Neanderthal
 361 rather than a gracile 'Modern.' This is particularly
 362 apparent from the substantially complete frontal
 363 bones found in the same cave in 2003, which is
 364 clearly not 'modern,' nor is it 'Neanderthal.' More
 365 recently, Soficaru et al. (2006) have reported six
 366 human bones from another Romanian cave, Peștera
 367 Muierii, which are clearly intermediate between
 368 robust and gracile Europeans. Although found in
 369 1952, they have now been dated to about 30,000
 370 carbon years, which might correspond to around
 371 35,000 sidereal years, and combine a partly modern,
 372 partly archaic brain case with a suite of other inter-
 373 mediate features (Fig. 5).



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Fig. 4 Peștera cu Oase
 344 mandible and separate face,
 345 intermediate between robust
 346 and gracile

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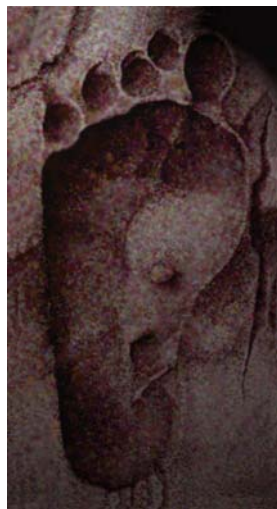
This pattern of features intermediate between what paleoanthropologists regard as Neanderthals and Moderns is found in literally hundreds of specimens apparently on the order of 45–25 ka old. Gracilization is a universal process in all world regions then occupied by humans, from Portugal to Australia. Intermediate forms between archaic *Homo sapiens* and *Homo sapiens sapiens* include examples, some of them much older, from right across the breadth of Eurasia, such as those from Lagar Velho, Crete, Starosel'e, Rozhok, Akhshtyr', Romankovo, Samara, Sungir', Podkumok, Khvalynsk, Skhodnya, Narmada, as well as Chinese remains such as those from Jinniushan. In Australia, the robust Kow Swamp population is only 10,000 years old, while gracile specimens from the same general region are tens of thousands of years older. This presents an overall picture that is very different from that which the replacement protagonists prefer. Their model cannot tolerate intermediate forms, nor can it allow hybrids, yet in Europe there is a clear continuation of some Neanderthaloid features right up to and into the Holocene. This is demonstrated not only by the Hahnöfersand specimen, but also by many others, such as the equally robust Mesolithic skull fragment from Drigge, about 6250 years old (Terberger 1998), and many more late specimens previously thought to be of the EUP. They range in age from the Magdalenian through the Neolithic, and younger. The process of gracilization has in fact continued to the present time, with notable changes continuing in the Final Pleistocene and the Holocene.

There are now almost no supposedly modern specimens left as possible contenders for attribution to EUP or Aurignacoid industries. The maxilla from Kent's Cavern, United Kingdom (~31 ¹⁴C ka BP, possibly older), and Pestera Cioclovina (~29 ¹⁴C ka BP) lack secure and diagnostic archaeological associations as well as morphological criteria. There are, however, numerous Neanderthal remains to fill this void. Of particular interest are the most recent, those from Saint Césaire (~36 ka), Arcy-sur-Cure (~34 ka), Trou de l'Abîme (Aurignacian), Vindija Cave (Olschewian, ~28 and ~29 ka), and Máriar-emeté Upper Cave (Jankovichian, ~38 ka). At the first site, the Neanderthal remains of a burial occur together with clear Châtelperronian artefacts, which until 1979 had been generally assumed to be

the work of anatomically modern humans. Arcy-sur-Cure yielded numerous ornaments and portable art objects, again with a Châtelperronian. This prompted various convoluted explanations of how these pendants could have possibly found their way into a 'Neanderthal' assemblage (e.g., Hublin et al. 1996; White 1993; a similar argument was used by Karavanic and Smith [1998] in explaining the UP bone points of Neanderthals in Vindija layer G1). The Jankovichian or Trans-Danubian Szeletian (Allsworth-Jones 2004) has provided three mandibular 'Neanderthal' teeth (Gábori-Csánk 1993). Trou de l'Abîme near Couvin in southern Belgium yielded Neanderthal remains together with a typical Aurignacian industry, and the Vindija late Neanderthals used EUP tools and technology. These most recent 'Neanderthals' found so far are more gracile than Neanderthals of earlier periods, and they are considered to be transitional (Fruyer et al. 1993; Smith and Ranyard 1980; Wolpoff 1999; Wolpoff et al. 1981). Vindija Vi-207 is a mandible of 29,080 ± 400 carbon years BP (OxA-8296); Vindija Vi-208 is a parietal of 28,020 ± 360 carbon years BP (OxA-8295) (Smith et al. 1999). These 'late Neanderthals' (or very robust 'Moderns') exhibit significant reduction in 'Neanderthaloid' features, such as mid-facial prognathism and supraorbital tori. The related stone tools and bone points are of EUP typology, and Ahern et al. (2004) also report the occurrence of apparent bone fabricators.

There are only three realistic alternatives to account for the EUP tool, rock art, and portable art traditions of Europe: they are either the work of 'Neanderthals,' or of the descendants of Neanderthals, or of invading 'Moderns.' There is currently no evidence for the third possibility. Of particular interest are the very numerous human footprints in Chauvet Cave (in Salle des Bauges, Salle du Crâne, and Galerie des Croisillons). While ichnological evidence may not be conclusive in this respect, its consideration is worthwhile. The superbly preserved human tracks I have examined in the cave are, in my view, more likely to be of Neanderthaloids than of 'Moderns,' for a number of reasons. In most if not all 'Neanderthal' skeletal remains it appears that the big toe is shorter than the second toe, whereas the converse applies to the known 'Crô-Magnon' remains as well as footprints. This may of course be coincidence; both versions can be found among

Fig. 6 Footprint of a child in Chauvet Cave, apparently of a Neanderthaloid individual



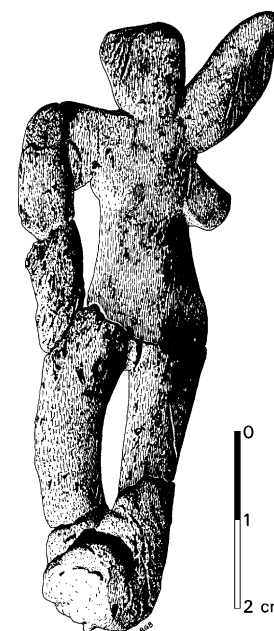
modern Europeans. However, in the case of the supposedly 8–10-year-old child that strode through Chauvet Cave, the second toe is not only longer, it is offset above its two neighbours (Fig. 6). In a child not used to wearing tight footwear, this might be a diagnostic feature. Moreover, the Chauvet tracks also show other characteristics that differ from most modern human tracks. The ratio of the widths across the heel and the front of the foot is markedly greater, and more pressure has been applied to the outside margin, which is perfectly straight (Clottes 2001, Fig. 28). This suggests a somewhat bow-legged gait, which may be consistent with Neanderthals.

The conceptually most complex portable and parietal art of the Upper Paleolithic is of the Aurignacian, including the two therianthropes from Swabia (Hohlenstein-Stadel, Schmid [1989], and Hohle Fels, Conard et al. [2003]) (Fig. 7); numerous further portable items from other caves in the Swabian Alb; the anthropomorph from Galgenberg (Bednarik 1989) (Fig. 8); the small corpus of rock art of l'Aldène, reflecting the principal faunal elements in the Chauvet art (and created before the decorated passage became closed 30,260 ± 220 BP (Ambert et al. 2005, 276–7; Ambert and Guendon 2005); the early phase of the rock art in Baume Latrone (Bednarik 1986; Bégouën 1941; Drouot 1953); and most particularly the early phase in Chauvet Cave (Chauvet et al. 1995; Clottes 2001; Clottes et al. 1995; Valladas et al. 2004), a site that

Fig. 7 Therianthropic ivory figure from Hohlenstein-Stadel, Germany, Aurignacian



Fig. 8 Serpentine figurine from Galgenberg, Austria, Aurignacian



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Fig. 9 The author in Chauvet Cave (photograph by J. Clottes)



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probably became sealed about 24 ka ago (Bednarik 2004) (Fig. 9). ‘Aurignacians’ seem to have been especially interested in ‘dangerous animals,’ and one of the most interesting cultural markers of ‘Aurignacoid’ traditions is the evidence of intentionally deposited remains of cave bears, especially their skulls. I will consider this aspect (found in Chauvet), one of many connecting the Middle Paleolithic with the EUP, in a separate paper.

In summary, we have no evidence that the Aurignacian, Châtelperronian, Uluzzian, Proto-Aurignacian, Olshewian, Bachokirian, Bohunician, Spitsyn culture, Szeletian, Jankovichian, Streletsian, Altmühlian, Lincombian, or Jerzmanovician (all of which seem to have developed in situ) are the work of physically modern people. We have evidence that at least five or six of them are the work of ‘Neanderthals’ or ‘post-Neanderthals,’ and quite probably this applies to all pre-Gravettian traditions in Europe. By the time of the Gravettian, the rate of gracilization of humans suggests culturally moderated breeding: robust characteristics were selected against by culturally determined preferences. Gracilization is a global phenomenon of the Final Pleistocene and Holocene, and it has been completely neglected until now that its great evolutionary cost (reduced muscle bulk and brain size, more delicate bone architecture) suggests that natural selection was replaced by ‘self-domestication’

(through culturally mediated mating choices, as implied by the distinctive sexual dimorphism of intermediate populations, such as those from the Czech sites).

This questions the entire model of the transition from ‘Middle Paleolithic’ to ‘Upper Paleolithic’ ‘cultures’ as it has been perceived by the discipline for many decades. The simplistic notion that the introduction of a genetically new population in Europe coincided chronologically with the appearance of a radically different technology and paleoart has been gradually eroded since the Châtelperronian had to be yielded to the ‘Neanderthals.’ There is now no evidence of the replacement of either culture or human population, but there is ample evidence of continuity. It has been known since the mid 19th century that paleoart has existed for hundreds of millennia in Europe, but this escaped the supporters of the replacement theory. ‘Upper Paleolithic’ aspects of technology in much earlier periods have been evident for a long time, and the entire nomenclature of the human history of the Pleistocene is in dire need of revision. Moreover, the impotence of paleoanthropology has been well illustrated for the past 150 years, from its response to the finds of the Kleine Feldhofer Cave and the first Javanese hominins, to Piltdown, to the pandemonium that followed the report of a small Final Pleistocene hominin from Flores just a few years

ago. These and many other examples should teach us to be sceptical of anything claimed in this field. The present Flores controversy, where warring protagonists offer interpretations ranging from ape to australopithecine to *Homo ergaster* to *Homo erectus* to *Homo sapiens*, has merely confirmed how history tends to repeat itself.

Perhaps some of the above-cited evidence can be challenged, but that is yet to be demonstrated. The present evidence implies that the paleoart of the Aurignacian, like that of the Châtelperronian and Bachokirian, is not the work of ‘fully modern’ *H. sapiens sapiens*. Archaeologists wishing to falsify this proposition will need to present unambiguously fully modern human remains (i.e., free of significant robust features) from a secure EUP context. Until they do this, the ‘domestication’ hypothesis is much better supported than the replacement hypothesis, and the makers of Aurignacian tools, rock art, and portable art were apparently not physically ‘modern.’ They were either ‘Neanderthals’ or ‘post-Neanderthals.’

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