

Lecture No. 2. Short-range versus long-range theories

Fundamental to any consideration of the evolution of human cognition, symboling and many other related developments is obviously the time frame in which it may have occurred. But while there is, as we have seen in the first lecture, reasonable consensus, at least in the very broadest terms, on the physical, especially skeletal, evolution of hominins, when we come to their non-physical development the disagreements could hardly be greater. Essentially, there are two schools of thought, described as the short-range and long-range theories, sometimes called the “discontinuist” and the “gradualist” models (d’Errico and Nowell 2000). These two diametrically opposed conceptions perceive two entirely different paths of non-physical human evolution. The *short-range model* rejects all evidence of symbol use prior to about 40,000 years BP, insisting that it commenced as part of the claimed cognitive revolution at the beginning of the Upper Palaeolithic. In the last few years the resolve of its protagonists has begun to wane somewhat as they have made first concessions and are tinkering with some aspects of their theory, but it still remains the dominant model in archaeology.

The *long-range model* perceives a gradual evolution of language, art-like productions, advanced hunting methods, shelter building, garment making, social complexity, and of course the symbol use which is thought drove most of these developments. This gradual evolution occurred over vast time spans well before 40 ka (40,000 years) ago, and some of it was already underway around a million years ago. The evidence for the long-range model consists of a panoply of material finds which the short-range protagonists are uniformly unfamiliar with. When confronted by individual finds that challenge their model they try to explain them away; or regard them as a “running ahead of time” (Vishnyatsky 1994); or pronounce them as untypical; or challenge their dating or the scholarly competence of their promoters. This is a familiar pattern in Pleistocene archaeology, dating back to the times of Boucher de Perthes and Pengelly, the “incompetent amateurs” who discovered the Palaeolithic in the early 1800s. This pattern continued throughout the history of archaeology, with the similarly “incompetent” discoverers of fossil man, Pleistocene art and *Homo erectus*, and many more scholars since, all of who were persistently rubbished, ridiculed and persecuted by orthodox archaeology.

Irrespective of which model is right, we have to note that there is currently no consensus of which time frame we need to look at if we wish to consider when cognitive evolution occurred, or against what kind of cultural background, or what course it might have taken. Before we can consider the topic of this course in any meaningful way, we need to make a decision which of the two opposing models we will adopt. There are no intermediate possibilities, because both models are incapable of accepting compromise. The short-range model would simply fall apart if it abandoned any of its underlying key assumptions, such as complete genetic separation of “Moderns” and archaic *Homo sapiens* types like the Neanderthals. On the other hand, the long-range model is more flexible, but certainly not capable of absorbing any of the short-range ideas. The two models are mutually exclusive, which leaves us with two possibilities: to develop our ideas in a schizoid fashion, observing the dichotomy in every subsequent consideration; or to first examine the dichotomy and arrive at an informed decision about which of the two models is right.

This lecture is dedicated to establishing which of these opposing models we should follow. This involves first a thorough examination of the short-range model, of its basis and underlying assumptions. Although an archaeological hypothesis, this model derives its main support from genetics. Its key assumption is that the ancestors of all extant humans conquered the world during the Late Pleistocene, being genetically, technologically, cognitively, culturally and intellectually superior to all of their contemporaries of the period preceding their Exodus from Africa. In the process they either exterminated or out-competed all their contemporaries, in all parts of the world then settled, therefore all humans from 27 ka BP onwards are descended from them alone. Because these “anatomically modern” ancestors of ours, the pinnacle of evolution, were a separate species, unable to breed with other hominids, all extant human populations must originate from a small, isolated population in some unspecified region of sub-Saharan Africa. Indeed, ultimately they all descend from one single female and male. They were the only humans who ever succeeded in crossing that Rubicon between the subhuman and the human, between instinct and intelligence, between absence and presence of culture.

The genetics

This “African Eve” model does not resemble a realistic model of phylogenetic evolution or demographic population dynamics. Moreover, the paradigm is not based on an unrefuted proposition of scientific status, but on controversial contentions of *some* geneticists (opposed by others), and there is virtually no archaeological evidence in its favour. Even the genetic justification of this model is fundamentally flawed. Different research teams have produced different genetic distances in nuclear DNA, i.e. the distances created by allele frequencies that differ between populations (e.g. Vigilant et al. 1991; Barinaga 1992; Ayala 1996; Brookfield 1997). Some geneticists concede that the model rests on untested assumptions; others even oppose it (e.g. Barinaga 1992; Templeton 1996; Brookfield 1997). The various genetic hypotheses about the origins of “Moderns” that have appeared like mushrooms over the past couple of decades

place the hypothetical split between Moderns and other humans at times ranging from 17 to 889 ka BP. They all depend upon preferred models of human demography, for which no sound data at all are available. This applies to the contentions concerning mitochondrial DNA (African Eve) as much as to those citing Y-chromosomes (African Adam; Hammer 1995). The divergence times projected from the diversity found in nuclear DNA, mtDNA, and DNA on the non-recombining part of the Y chromosome differ so much that a time regression of any type is extremely problematic. Contamination of mtDNA with paternal DNA has been demonstrated (Gyllensten et al. 1991) and Kidd et al. (1996) have shown that, outside Africa, the elements which haplotypes are composed of largely remain linked in a limited set of them.

The genetic picture in Africa as well as elsewhere has been found to be far more complicated than the Eve proponents ever envisaged. The much-promoted claims that Neanderthals were genetically different from modern Europeans, based on very fragmentary DNA sequences, were seriously misleading. Gutierrez et al. (2002) have shown. Their analysis suggests that the pair-wise genetic distance distributions of the two human groups overlap more than claimed, if the high substitution rate variation observed in the mitochondrial D-loop region and lack of an estimation of the parameters of the nucleotide substitution model are taken into account. Relethford (2002) has detected drastic spatiotemporal changes in the genetic profiles of three recent Chinese populations, negating the idea of regional genetic homogeneity. He found that the Linzi population of 2500 years BP is genetically more similar to present-day Europeans than to present-day eastern Asians. This refutes the idea that regional comparisons of DNA can establish affinity or its absence. Assumptions about a neutral mutation rate and a constant effective population size are completely unwarranted, and yet these variables determine the outcomes of all the genetic calculations. For instance, if the same divergence rate as one such model assumes (2%–4% base substitutions per million years) is applied to the human-chimpanzee genetic distance, it yields a divergence point of 2.1 to 2.7 million years, which we consider unambiguously false. Nei (1987) suggests a much slower rate, 0.71% per million years, according to which the human-chimpanzee separation would have occurred 6.6 million years ago, which is close to the estimate from nuclear DNA hybridization data, of 6.3 million years. It also appears to be close to what the fossil record seems to indicate. However, this would produce a divergence of Moderns at 850 ka BP, over four times as long ago as the favored models, and eight times as long ago as the earliest fossils of *purported* Moderns ever found (though both their dating and attribution are controversial). To explain away the perplexingly late split of the Moderns, some of the short-range geneticists have even resorted to suggesting mtDNA transfer between “proto-humans” (e.g. Australopithecines) and proto-chimpanzees (i.e. species presumably separated by millions of years of evolution), while at the same time excluding such a possibility for archaic and modern populations (Hasegawa et al. 1985). These kinds of absurdities tell us a great deal about the short-range model.

Interestingly, when the same “genetic clock” used in all this is applied to dogs, and suggests that the split between wolves and dogs occurred 135 ka ago, archaeologists reject it on the basis that there is no palaeontological evidence for dogs prior to about 14 ka BP. In other words, the weak theory that provides the *only* basis for the African Eve scenario is rejected when applied to another species. The scenario of genetic isolation, long enough to render Eve’s progeny unable to interbreed with any other humans, is another unsupportable short-range notion. Interbreeding yielding fertile offspring occurs between many species (in wolf and coyote, for instance) and we know from the example of dogs that a period of significantly more than 135 ka of genetic isolation would be needed for the Eve model to work. What would be the minimum population necessary for continued isolated existence over a couple of hundred millennia, and what is the probability that their reproductive isolation was never interrupted by external genetic input over that period? In combining the model of a population bottleneck with that of an endemic population we also need to remember that genetic bottlenecks tend to reduce fitness in the population (Bryant et al. 1986), rather than bring about the population’s supremacy (cf. Hawks et al. 2000), so how did Eve’s progeny attain their superior qualities? Another genetic model (Pennisi 1999) has modern humans evolving from two discrete populations, one resulting in modern Africans, the other in non-Africans. Recently, Templeton (2002) contradicted the simplistic replacement hypothesis genetically. Using ten different haplotype trees (MtDNA, Y-chromosomal DNA, two X-linked regions and six autosomal regions), Templeton showed that following an initial exodus from Africa at about 1.7 million years ago, there were at least two subsequent major expansions out of Africa. One occurred at 840 to 420 ka ago, the second at 150 to 80 ka ago. The genetic data also shows ubiquity of genetic interchange or interbreeding between human populations *throughout the 1.7 million years*, which again refutes the recent out-of Africa replacement theory.

It is also of concern that the first colonization dates assumed by the geneticists supporting the Eve model are mostly false (see Cann et al. 1987), and these researchers admitted from the beginning of their involvement that their base-pair substitution rates were based on the (almost certainly false) assumption of single colonization events. It has long been known in Australia, for instance, that there were multiple settlement events, and the same can be assumed in most other cases of colonization (Bednarik and Kuckenburger 1999). In Australia, the lineage of the earliest known “anatomically modern” remains, Lake Mungo 3, has been shown to have probably diverged before the most recent common ancestor of contemporary human mitochondrial genomes (Adcock et al. 2001). Therefore, the African Eve model, once again, has failed to account for the evidence, as it does in every critical test.

One potential test would be to apply mtDNA analysis to *Homo floresiensis*, to see when it diverged from its ancestral clade. DNA results extracted from the numerous remains already available of that species are likely to spell doom for the Eve model. Instead of unambiguously showing that Moderns originate conclusively in one region, Africa,

all the available genetic data suggest that gene flow occurred in Old World hominids throughout much of recent human evolution (Templeton 1996, 2002), which is also strongly suggested by all available empirical evidence, both palaeoanthropological and archaeological. *Homo sapiens sapiens* seems to have evolved as a single extended breeding unit across much or most of the region then occupied by hominids, from southern Africa to eastern Asia. Extensive genetic drift and episodic genetic isolation rather than mass migration probably accounts for the mosaic of hominin forms through time. In the absence of any reliability of the proposed rates of nucleotide changes and the many variables still to be accounted for effectively, the contentions by the replacement advocates are clearly unsupported, and nucleotide recombination renders their views redundant (Strauss 1999).

The fossils

The African Eve model derived initially from G. Bräuer's work, which relied on the "datings" of Professor Reiner Protsch "von Zieten" (his aristocratic title is as bogus as is his second PhD). It now appears that all of Protsch's dates for German human remains were spectacularly false, and that the Eve supporters had been the subjects of a hoax for more than 35 years. If they had not relied on the claimed ages of the German fossils, it is unlikely that the model would have been launched quite so enthusiastically, if at all. The recent rejection of the Upper Palaeolithic age of nearly all German human remains formerly attributed to that period has certainly great consequences for the African Eve model.

Of particular interest is the Hahnöfersand calvarium, described as so robust that it was judged to show typical Neanderthal features (Bräuer 1980). It was initially dated to the earliest "Upper Palaeolithic" (Fra-24: $36,300 \pm 600$ BP; UCLA-2363: $35,000 \pm 2000$ BP, or $33,200 \pm 2990$ BP; Bräuer 1980), results that conflict sharply with those now secured by Terberger and Street (2003): P-11493: 7470 ± 100 BP; OxA-10306: 7500 ± 55 BP. The re-dating 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 analysed two individuals from the Urdhöhle near Döbritz, which had been attributed to the Upper Palaeolithic, and found them both to be about 8400 years old. Indeed, of all the German "Upper Palaeolithic" human remains, only one remains safely dated to earlier than 13,000 BP, the interred specimen 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 half, if not the first two thirds of the west-central European Upper Palaeolithic. Nearly all the dates for German humans from the radiocarbon laboratory of the University of Frankfurt am Main appear to be substantially false, as do some of those from the University of California, Los Angeles. In addition, another German key specimen, the skull from Kelsterbach, has mysteriously disappeared from the safe of the Frankfurt institution. It had been dated to $31,200 \pm 1600$ (Fra-5) (Protsch und Semmel 1978; Henke und Rothe 1994), but is now also believed to be of the Holocene, perhaps the Metal Ages (Terberger and Street 2003).

The African Eve model has also heavily depended on the anatomically modern Vogelherd specimens to believe that the people of the Aurignacian, the first Upper Palaeolithic "culture", were in fact "Moderns". This was particularly precipitate, because anyone who has actually examined the Vogelherd skull (Stetten I) will have been struck by its modern appearance, both anatomically and in terms of its preservation. 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 favored an attribution to the site's Neolithic occupation. The placement of the Vogelherd individuals in the Aurignacoid deposits always seemed incongruous, and yet Stetten I has long been one of the replacement camp's key exhibits. Its putative age of 32 ka now stands refuted by its direct dating to the late Neolithic period (Conard et al. 2004), confirming the obvious: that it is part of an intrusive burial. 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 absolutely nothing about the skeletal anatomy of the "Aurignacians".

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 four juveniles in the late Aurignacian, Movius (1969) suggested an age of about 30 ka BP and preferred an attribution to the Aurignacian 2. The recent re-dating to about 27,760 carbon years BP renders both opinions invalid, and the remains are of the Gravettian, i.e. the "culture" that followed the Aurignacian. Moreover, the frequent reference to the Crô-Magnon remains as the "type fossil" of early "modern" anatomy in Europe requires qualification. Wolpoff has long pointed out that 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 robust Crô-Magnon series question the full modernity of this 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 Palaeolithic humans, it is thought that their remains 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 the site's archaeology (Jelínek 1987). Recent attempts to provide direct dates from

some of the human remains (Wild et al. 2005) yielded five results ranging from about 26,330 BP 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 (Smith 1982, 1985; Frayer 1986; Trinkaus and Le May 1982). There appears to be pronounced sexual dimorphism, with male crania being very robust. The female specimens show similarities with, as well as differences from, accepted Neanderthal females. 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 Palaeolithic, 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 Palaeolithic”) at Velika Pećina, Croatia, close to the Neanderthal site Vindija. This specimen, too, has been a principal support for the replacement advocates, but it too has joined the long list of European humans whose age was grossly overestimated. It is now considered to be only 5045 ± 40 radiocarbon years old (OxA-8294; Smith et al. 1999).

The currently earliest “intermediate” find in Europe, the Peștera cu Oase mandible from southwestern Romania (Trinkaus et al. 2003), is perhaps about 35,000 radiocarbon years old, but it is without an archaeological context. Although in some aspects “modern”, its “derived Neanderthal features” identify it as a Post-Neanderthal rather than a gracile “Modern”. The loss of the only relevant Spanish remains, from El Castillo and apparently of the very early Aurignacian, renders it impossible to determine their anatomy. French contenders for EUP age present a mosaic of unreliable provenience or uncertain age, and direct dating is mostly not available. Like the Vogelherd and other specimens, those from Roche-Courbon (Geay 1957) and Combe-Capelle (originally thought to be of the Châtelperronian levels; Klaatsch and Hauser 1910) are thought to be of Holocene burials (Perpère 1971; Asmus 1964), and the former is now apparently lost. Similar considerations apply to the partial skeleton from Les Cottés, whose stratigraphical position could not be ascertained (Perpère 1973). Finds from La Quina, La Chaise de Vouthon and Les Roches are too fragmentary to provide diagnostic details. The *os frontale* and fragmentary right maxilla with four teeth from La Crouzade, the mandible fragment from Isturitz and the two juvenile mandibles from Les Rois range from robust to very robust. Just as the Crô-Magnon human remains now appear to be of the Gravettian rather than the Aurignacian, so do those from La Rochette. The Fontéchevade parietal bone does lack prominent tori but the site’s juvenile mandibular fragment is robust.

This pattern of features intermediate between what palaeoanthropologists regard as Neanderthals and Moderns is found in literally hundreds of specimens apparently in the order of 45 to 25 ka old. They occur also elsewhere in Europe, and their relatively recent age (ranging from 35 ka onwards) render it useful to refer to them as Post-Neanderthals. Intermediate forms between archaic *Homo sapiens* and *Homo sapiens sapiens* existed also in Asia and Australia. They include examples, some of them much older, from right across the breadth of Eurasia, such as those from Largo Velho, Crete, Starosel’ e, Rozhok, Akhshtyr’, Romankovo, Samara, Sungir’, Podkumok, Khvalynsk, Skhodnya, Narmada, as well as Chinese remains such as those from Jinniushan. This presents an overall picture that is very different from that which the replacement protagonists prefer. Their model cannot tolerate such 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 others, such as the equally robust Mesolithic skull fragment from Drigge, also from northern Germany, which is about 6250 years old (Terberger 1998) and numerous other late specimens previously thought to be of the EUP. They range in age from the Magdalenian through to the Neolithic, and younger. The process of gracilization has in fact continued to the present time, as we have noted in the first lecture.

The second issue emerging from this brief review is that 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), and the Romanian remains from Peștera Muierii (~30 ¹⁴C ka BP) and Peștera Cioclovina (~29 ¹⁴C ka BP) all lack secure and diagnostic archaeological association. 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), Zafarraya Cave (~33.4 ka) and Vindija Cave (~28 and ~29 ka). At the first site, the Neanderthal remains of a burial occur together with clear Châtelperronian artifacts, which until 1979 had been generally assumed the work of anatomically modern humans. Arcy-sur-Cure, also in France, yielded numerous ornaments and portable art objects, again from a Châtelperronian. This prompted various convoluted explanations of how these pendants could have possibly found their way into a “Neanderthal” assemblage (e.g. White 1993; Hublin et al. 1996). On the other hand, Zafarraya Cave, near Malaga, provides Mousterian tools (Hublin et al. 1995). Trou de l’Abîme near Couvin in southern Belgium yielded Neanderthal remains together with a typical Aurignacian industry, and there can be no question that the Vindija late Neanderthals used EUP tools and technology. Not only has that site

yielded the most recent “Neanderthals” found so far—and from a site in south-central Europe at that—these are more gracile than Neanderthals of much earlier periods, and they are considered to be transitional (Smith and Raynard 1980; Wolpoff et al. 1981; Frayer et al. 1993; Wolpoff 1999; Smith et al. in press). The separation between Neanderthals and “Modems” is entirely artificial, there is a distinct continuum evidenced in hundreds of specimens. Vindija Vi-207 is a mandible of $29,080 \pm 400$ carbon years BP (OxA-8296), Vindija Vi-208 is a parietal of $28,020 \pm 360$ carbon years BP (OxA-8295) (Smith et al. 1999). These “late Neanderthals” (or very robust Modems) exhibit significant reduction in “Neanderthaloid” features, such as mid-facial prognathism and supraorbital tori. The related stone tools are of EUP typology, and Ahern et al. (2004) report the occurrence of apparent bone fabricators.

Ignoring these many contradictions to their ideas, the replacement proponents have responded to the recent developments in Germany by contending that the new data bolster their model, because the “Neanderthaloid” Hahnöfersand specimen had been suggested to be a hybrid (Bräuer 1980). In this futile argument they seem to have overlooked that the new evidence shows, ironically, that *they have argued themselves into a corner*. They have hailed each of the very late dates for Neanderthal remains as they appeared in recent years as a confirmation of their prediction that the evidence “effectively precludes any hypothesis of a gradual evolution from Neanderthal to anatomically modern populations within Western Europe itself” (Mellars and Stringer 1989: 8). They had strongly contended that “a whole spectrum of radical cultural innovations” (op. cit.) appeared with the beginning of the Aurignacian, and that the “symbolic explosion model for the Middle–Upper Palaeolithic transition, criticized by Bednarik, has the merit of emphasizing the entirely modern character of the Aurignacian behaviour” (d’Errico 1995: 618). According to them, the people of the Aurignacian are “indistinguishable” from us in terms of cognition, behavior and cultural potential. Perhaps this is so, but what the evidence now shows is that the period from 45 ka to 28 ka BP has produced dozens of Neanderthal remains in Europe, but no securely dated, unambiguously fully modern human remains. This point is reinforced by the occurrence of undisputed Neanderthal finds together with EUP lithic traditions at several sites, but no Modems have so far been found in clear association with Aurignacian or any other EUP artifacts (Churchill and Smith 2000b). Therefore the proposition that the Aurignacian and other Aurignacoid or EUP industries are traditions of Neanderthals or of their descendants is supported by evidence, the proposition that it is the culture of invading “Modems” is not. Hence we are left with the dictum coined by the African Eve advocates themselves: *that the EUP people (i.e. late Neanderthals) from about 45 ka BP on, were of “entirely modern behavior”*.

The “short-range” advocates have apparently failed to grasp the effects of the new data on their hypothesis (Mellars 2005). There are only three realistic alternatives to account for the EUP tool, rock art and portable art traditions: that they are the work of Neanderthals, or of the descendants of Neanderthals, or of invading Modems. Since there is currently no evidence for the third possibility, and the two others are entirely unacceptable to the African Eve advocates because they would refute their hypothesis, one would have thought that they might reconsider. Certainly, the onus is presently on these scholars to present evidence that there were anatomically fully modern humans, free of any “Neanderthaloid” features, in Europe during the entire first half of their “Upper Palaeolithic”, i.e. since 45 ka BP. Until they do this, their contentions about human evolution over this period in the European theatre are contradicted by all available skeletal evidence.

The cultures

The record so far mentioned already suffices to significantly discredit the replacement or “short range” model, but there is much more its proponents have consistently ignored. The record of technologies straddling the imposed and contrived division between Middle and Upper Palaeolithic technocomplexes is perhaps even more persuasive. Across Europe, from Spain to Russia, the evolution of the EUP traditions from the preceding Mousterian and Micoquian technocomplexes is evident at literally hundreds of sites. Since the times of Lothar Zotz, it has been widely purported that the “invading Modems”, the first in history bringing beads to the natives, entered Europe from the southeast, perhaps through a “Danube corridor” or through the Balkans. However, there is no archaeological indication of any EUP technology spreading from the southeast to western Europe — or, for that matter, from the Levant or anywhere else, supporting the replacement model. The earliest appearance of EUP industries occurs fairly simultaneously between 45 ka and 40 ka BP, or slightly earlier, across much of southern and eastern Europe (and in Siberia; e.g. Makarovo 4/6 and Kara Bom). The Aurignacian of El Castillo level 18, in Spain, seems to commence well before 40,000 years ago (Cabrera Valdés and Bischoff 1989; carbon dates of $40,000 \pm 2100$, $38,500 \pm 1800$, $37,700 \pm 1800$ BP), but unfortunately the human remains from the deposit have been lost. The tool industry shows distinctive typological continuities from the underlying typical Mousterian in layer 20 (Cabrera Valdés and Bernaldo de Quirós 1985). Diagnostic Aurignacian types such as carinated and nosed scrapers occur in the Mousterian levels, not only at El Castillo but also at El Pendo and Cueva Morín. The change from the “Middle Palaeolithic” to the EUP is marked here primarily by a progressive increase in the number of burins and end scrapers, at the expense of side scrapers. At Abric Romani, the lowest AMS dates from the Aurignacian average 37 ka BP, but the probably more relevant uranium series dates point to a sidereal age of 43 ka BP (Bischoff et al. 1994). This distortion (see below) suggests therefore that the earliest Aurignacian in northern Spain should be up to 45 ka old. On the other hand, in Caldeirão Cave, Portugal, the change from the Mousterian to the basal EUP occurs only at about 27.6 ka BP, shortly after the Aurignacian appears in the far south of Spain (e.g. at Gorham’s Gave, Gibraltar, at 28 ka BP). At El Pendo, the Lower Périgordian (i.e. Châtelperronian) industry, which in France has been attributed to Neanderthals, overlies two Early Aurignacian levels,

a stratigraphic pattern also observed in France, e.g. at Roc de Combe (Bordes and Labrot 1967) and La Piage (Champagne and Espitalié 1981). The El Pendo Châtelperronian from level VII has yielded a series of bone points and perforated objects (González Echegaray et al. 1980). The latter were almost certainly used as pendants, such as those found at Arcy-sur-Cure. The Châtelperronian at Morín Cave has been dated to about 36,950 BP, an antiquity similar to that of the same tradition at French sites (37–33 ka BP). The most recent “Middle Palaeolithic” occupation known in Spain, however, is at Abric Agut. According to both radiocarbon and U-series dating, it occurred 13 to 8 ka BP, i.e. at the Pleistocene-Holocene interface (Vaquero et al. 2002).

The Iberian pattern of a mosaic of regional EUP lithic industries continues further east along the Mediterranean. In southern Italy, several Aurignacoid variants have been reported, such as the Uluzzian (Palma di Cesnola 1989), the Uluzzo-Aurignacian and the Proto-Aurignacian (43–33 ka BP). Here, as much as 30% of lithic assemblages are comprised of blades and prismatic cores (Kuhn and Bietti 2000; Kuhn and Stiner 2001). The pattern of a gradually decreasing component of Middle Palaeolithic technology evident in Spain is found here also, particularly in the three stages of the Uluzzian (Palma Di Cesnola 1976). In the Alpine region, the final Mousterian grades seamlessly into the Olschewian, another Aurignacoid tradition (42–35 ka BP). Further east this mosaic includes the Bachokirian of the Pontic region (>43 ka BP), the Bohunician of east-central Europe (Svoboda 1990, 1993; 44–38 ka BP), and the Spitsyn culture of Russia (>40 ka). Then there is a succession of traditions connecting Middle Palaeolithic biface technocomplexes, including the late Eastern Micoquian, with typical late Palaeolithic ones, through the Szeletian of eastern Europe (Allsworth-Jones 1986; 43–35 ka BP), the Jankovician of Hungary with its osteal artifacts, the Streletian with its still numerous leaf-points, and those of the north European Altmühlian (c. 38 ka BP), Lincombian (38 ka BP) and Jerzmanovician (38–36 ka BP). These and other “intermediate” industries, such as those of Anatolia, all indicate that a separation between Middle and Upper Palaeolithic technocomplexes is severely misleading. Such a distinction is not reflected in the technologies of the period from perhaps 45 ka to 30 ka. Indeed, a degree of regionalization precedes this period even in the late Mousterian (Kozłowski 1990; Stiner 1994; Kuhn 1995; Gamble 1999; Riel-Salvatore and Clark 2001). That period is marked by both miniaturization and increasing use of blades, by improved hafting and the use of backed or blunted back retouch, apparently heralding subsequent developments. Therefore it is useful to challenge the concept of an EUP: there is no clear-cut separation from the late “Middle Palaeolithic” industries, and this artificial dichotomy has only served to emphasise gradual changes in technology (Fedele et al. 2003). Instead of denoting these numerous intermediate tool traditions as an early Upper Palaeolithic, they could just as credibly be defined as late Middle Palaeolithic. Indeed, there are almost no parts (as distinct from individual sites) of Europe where a clear separation of Middle and Upper Palaeolithic stone tool sequences can be observed.

Looking further afield, these two definitions have even less currency. In parts of Africa, Upper Palaeolithic technologies occur tens of thousands of years before their advent in Europe: the microlithic features of the Howieson’s Poort phase, the prismatic blades of the Amudian, the bone harpoons from Katanda come to mind. In India, the Upper Palaeolithic is notoriously hard to pinpoint, while China lacks a distinctive Middle Palaeolithic (Xing Gao and Norton 2002). In Australia, the Middle Palaeolithic mode of production (Foley and Lahr 1997) continues until well into the Holocene (and in Tasmania to European contact), while the Acheulian of Africa remains prominent as recently as 40 ka ago, and the Middle Stone Age of sub-Saharan Africa continues until 20 ka ago. On the Indonesian island of Flores, a putative separate hominid species derived from *Homo erectus* or even older stock used “Upper Palaeolithic” tool types, while one of the two different Acheulian hominids at Narmada (Kennedy et al. 1991; Sankhyan 1997) has a brain capacity well above that of Moderns.

Nothing seems quite as well ordered in hominid evolution as our neat Eurocentric theories predict it should be. Some of the most challenging evidence comes from Australia. Here, first colonization is universally agreed to have been by modern humans, though with some archaic features. The replacement advocates have no choice but to argue that the symbolism revolution they place at the beginning of the Upper Palaeolithic must have occurred before this colonization event, perhaps 60 to 40 ka ago. But the technology of the Australids is certainly Middle Palaeolithic, and often even Lower Palaeolithic, and continues to be so until mid-Holocene times (Brumm and Moore 2005). Once again, the replacement scenario is clearly refuted on the basis of the definitions of its own advocates.

Summary

The overwhelming impression of the collective evidence from the artifact assemblages of Europe, from the time interval of about 45 ka to 25 ka ago, is that there is no evidence of any sudden change of technology as one would expect to find had there been an intrusion of genetically different people with a superior culture. Instead, there is a complex mosaic of regional traditions that, in general, exhibit a gradual change of several variables, such as tool size, knapping method, retouch and reuse. In numerous cases, in the continent’s east, south and southwest, the gradual evolution of so-called Upper Palaeolithic traditions from Middle Palaeolithic ones can be traced at individual sites. This alone negates any ideas of a movement of people to account for changes. Moreover, the idea that different ethnic groups such as Neanderthal sapiens people and Moderns used different technocomplexes is perhaps one of the greatest fallacies of the African Eve proponents. Several “Upper Palaeolithic cultures” are the work of “Neanderthals”, just as “Moderns” used a Middle Palaeolithic mode of production, for instance in the Maghreb, Levant, in Spain and Ukraine. Wherever robust and more gracile forms of humans apparently co-existed, be it in the Levant, in Australia or in any

part of Europe, they appear to have shared similar cultures, technologies, even ornaments. Therefore, the idea that one can trace ethnic differences through tool assemblages is unlikely to be helpful. Certainly, the Aurignacian did not arrive from the Levant, on current evidence it would seem to commence in Catalonia and Cantabria, and other EUP traditions seem to emerge about the same time in various eastern European centers, such as the Russian Plain. Similarly, the use of unproven taxonomic technological divides, especially that between Middle and Upper Palaeolithic, as reified tools of analysis and definition is as unfortunate as the use of minor skeletal differences, such as those between “Neanderthals” and “Moderns”, in inventing movements of populations. Not only is there no evidence of any major population replacing another in Europe during the period in question, this is again an exercise in trying to make the evidence fit the theory. All of this has long been known and, to some extent, appreciated, but now there is a new possibility: that the Aurignacians, and indeed all “Aurignacoid people”, were not Moderns, but Neanderthals. This should prompt the capitulation of the African Eve advocates, because in the final analysis they placed all their trust on the unassailability of the concept that the Aurignacian derives from Moderns. They have for decades waxed lyrical about the cognitive sophistication evidenced by palaeoart and beads that could not possibly have anything to do with those brutish Neanderthals. If all this wonderful art were the work of Neanderthal descendants, the replacement model would be defeated on all counts: technology, culture, genetics and physical anthropology. Only a foolhardy scholar would now argue that the early Aurignacians were anatomically fully modern. So even if the retreating argument were to be now, perhaps the Aurignacian started as a Neanderthaloid society, but by the time of Chauvet and Vogelherd (32 ka) it had become the province of Moderns, that would still negate the integrity of the Eve model. Why should this “culture” be started by Neanderthals, and then, half-way through, be taken over by “culturally superior” invading “Moderns”?

Even more powerful refuting evidence will become apparent later in this course, but what has been said so far certainly suffices to discredit the short-range model of cognitive evolution entirely. There was no replacement of the robust Europeans of Middle Palaeolithic times by invading graciles from Africa. If there had been such an invasion, the presumably dark-skinned graciles would have found it hard to out-compete the physically much stronger, climatically much better adapted and no doubt also more numerous resident Neanderthals. The much sounder hypothesis, and one that is supported by all available evidence, is that cultures evolved locally, in situ, as did, on the whole, the people concerned. The Upper Palaeolithic art traditions, for instance, are clearly a local development in central and western Europe, they were not introduced from Africa or anywhere else — and they were initiated by Neanderthals and developed by Post-Neanderthals. We must always remember that we know absolutely nothing about one half of the human Ice Age population, in Europe or anywhere else. The people who lived on coasts, in deltas or along the lower reaches of major rivers were no doubt more sedentary, had much more reliable food sources and they made up around half the human population. Because of the massive fluctuations of the sea level throughout the Pleistocene, all traces of them have been destroyed. Not only is our knowledge of the mobile inland hunters extremely limited and skewed by various factors, we know absolutely nothing at all about the genetic, cultural and technological status of the no doubt more developed coastal tribes, and what they were able to contribute to evolution.

The most probable explanation for the changes in Europe during the EUP is that the Campanian Ignimbrite (CI) event in southern Italy (Barberi et al. 1978; Fedele et al. 2002) and the immediately subsequent Heinrich Event 4 prompted major demographic adjustments. The CI volcanic eruption, which occurred $39,280 \pm 110$ years BP, was the greatest catastrophe in Europe’s Late Pleistocene and the attendant stresses or interactions among human groups would have facilitated rapid adaptation. That very same mechanism could plausibly affect genetics and human morphology in much the same way. A sharp reduction in gene pool size is the most effective factor in the acceleration of phylogenetic change in a population, particularly if it is combined with genetic drift across contiguous populations subjected to demographic adjustments. Certainly, there is no evidence that the humans concerned were anything other than very late Neanderthals; there is no indication of the presence of “more modern” types in Europe at 39 ka to 35 ka BP. Nor are the pre- and post-IC event artifact assemblages sufficiently different to postulate any involvement of intrusive populations. It is then unnecessary to resort to far-fetched mass migration and replacement from Africa.

If we add to this explanation the effect when breeding mate selection becomes increasingly moderated by cultural factors (such as cultural constructs of attractiveness or social position), we have a far more effective explanation for the worldwide change from robust to gracile types from roughly 40 ka to 10 ka. This is certainly not a development unique to Europe, it is found in Australia, Asia and Africa as well. There is no natural evolutionary explanation for this universal change, it did not involve any increase in brain size or other improvement in evolutionary fitness. In fact, Neanderthals had larger brains than their descendants, modern Europeans. Nor does the cranial gracility of modern humans confer any evolutionary benefit on them, and yet physical anthropologists have uniformly failed to ask the obvious: why did *Homo sapiens* change to gracile skull architecture and other inferior skeletal features? It is incumbent upon us to explain why a species should suddenly, in evolutionary terms, develop such regressive features as thinner skulls, significantly reduced bone and muscle strength, and perhaps even hair loss in a cold region. Nature does not select for such plainly disadvantageous variables, but culture might. The most logical explanation is that cultural factors had begun to dominate breeding patterns to the extent that modern humans are the outcome of their own domestication. The dog, domesticated to even more radical skeletal extremes in just 14 ka, provides a dramatic example of the effects of domestication. We would be hard pressed to deny that cultural determinants had become so powerful in the recent evolutionary history of humanity that they could have selected in favor of gracility. The most parsimonious theory to account for the apparent reduction in evolutionary fitness is that physical appearance became a cultural construct

affecting mate choice, beginning with a sexual preference of females with juvenile characteristics. In Europe it is clear that in the Post-Neanderthal populations, gracility began as a female feature; the decline of robusticity in males lagged many millennia behind the gracilization of females. Ethologically, sexual dimorphism is usually related to such behaviour as fighting between males, but its rapid disappearance between 35 and 20 ka among European humans suggests not a selection in favour of not fighting, it suggests a non-natural factor — a cultural factor: constructs of attractiveness determined mating patterns. Individuals considered attractive had more offspring, and it is they who “replaced” the robust genes.

Irrespective of this theory, for the present purpose it suffices to prefer the hypothesis that replacement in Europe of Robusts by Graciles was apparently not the result of migration. With this unfounded belief falls the short-range model of human cultural evolution, and for the rest of this course we shall assume that the long-range model is the valid one.

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