KEYWORDS: ***Pleistocene rock art – Aurignacian – Dating – Cave bear – Ethnicity***

ANTIQUITY AND AUTHORSHIP OF THE CHAUVET ROCK ART

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Abstract. The veracity of the carbon isotope dating attempts relating to the rock art in Chauvet Cave is reviewed, together with the merits of their criticisms. The attribution of the cave art to the Aurignacian is validated by several factors and stylistic objections are refuted. The question of the ethnicity of the Aurignacian artists is also considered, leading to the cognisance that they are very unlikely to have been 'anatomically modern' humans. There is currently no sound evidence that the 'Aurignacians' were not robust *Homo sapiens* people, i.e. Neanderthals or their descendants. The gracilisation humans experienced in the Final Pleistocene and Holocene is attributed not to evolutionary processes, but to cultural intervention through breeding preferences leading to the neotenous features characterising present-day humans.

Introduction

The most painstakingly studied and also one of the most pristine Palaeolithic cave art sites known is Chauvet Cave in the French Ardèche (Chauvet et al. 1995; Clottes 2001). The standard of the fieldwork being carried out there is peerless (Bednarik 2005). The site's rock art is also the best-dated among the European Pleistocene rock art sites so far subjected to any form of scientific dating (Clottes et al. 1995; Valladas and Clottes 2003; Valladas et al. 2004). Interestingly, the Chauvet Cave dating endeavours have attracted more sustained criticism than any of the other attempts to date European Pleistocene cave art (Zuechner 1996; Pettitt and Bahn 2003). The reason for this is that the Chauvet results were the first severe challenge to the traditional stylistic chronology of Upper Palaeolithic rock art (Bednarik 1995a). There is considerable disagreement on this point, with some authors defining Chauvet as blending in well with aspects of style and content of secure Aurignacian art, such as the series of portable objects from south-western Germany, with others rejecting the Aurignacian antiquity of Chauvet on the basis of their individual stylistic constructs, and favouring its placement in the Magdalenian.

It is very healthy to subject scientific propositions to falsification attempts, and all current dating claims for rock art, anywhere in the world, are tentative and based on experimental methods. They are presentations of testable data, and need to be interpreted in the context of the considerable qualifications that apply to them all (Bednarik 2002). However, the use of stylistic argument (i.e. rhetoric based on untestable cognitive processes involving autosuggestion) needs to be questioned. Scientific propositions need to be falsified, but not by non-scientific notions that are themselves inaccessible to falsification. The issue is not whether stylistic constructs are valid; the issue is that they are intuitive. To see how such revisionist efforts fare in the case of Chauvet Cave, I offer the following for consideration.

The question of antiquity

Among the 3703 identified faunal remains found on the floor surface of the extensive cave, those of the cave bear account for 91.8% (Philippe and Fosse 2003), and there are about 315 identifiable cave bear hibernation pits preserved in the cave. Clearly it was a bear hibernation site, like thousands of others across Europe (Bednarik 1993), and probably so for tens of millennia. The most recent cave bear finds in the main cave are about 24 000 years old, while the Salle Morel, a small side chamber, appears to have remained open to that species until 19 000 years ago (Fig. 1). The timing of the collapse of the cave entrances is confirmed by the recent dating to 18 000 BP of a stalagmite grown on one of the uppermost collapse boulders inside the blocked original entrance. The collapse must have occurred significantly earlier, and since about 24 000 years ago, the cave was only entered by small animals, such as snakes, martens and bats. On present evidence, a Magdalenian age of the rock art is therefore precluded by this context. It is

Figure 1. *Floor plan of Chauvet Cave, showing the locations of three intentional depositions of cave bear bones.*

also precluded by the simple fact that clear depictions of cave bears occur in Chauvet, and that this species is thought to have been extinct in the region by the beginning of the Magdalenian (Rabeder et al. 2000: 107). The distinctive shape of the forehead of this species, distinguishing it from the brown bear, is not just clearly indicated, it is emphasised in some of the depictions.

So far, three instances of anthropic deposition of cave bear remains have been observed on the cave floor, two in the Salle des Bauges and one in the Salle du Crâne (Clottes 2001; Bednarik 2005). They are of importance to the relative dating of the human activity in the cave (see below). Generally, this evidence is in excess of 30 000 years old at the known sites, and if the finds in Chauvet are of the same tradition, which seems very likely, the first phase of the cave's human use must also predate that time. That does not necessarily prove that the cave's early rock art phase has to be of the same period, but the onus to demonstrate that it is not is on those rejecting the Aurignacian attribution of this art. No such refuting evidence has been offered, and the doubters seem to be inspired by traditional stylistic reasoning alone.

Some of their arguments are mistaken or simply false:

> Nevertheless, the rock and cave art which is definitely known to be Aurignacian looks pretty crude and simple, a long way from Chauvet — which of course is why the Chauvet dates caused such a shock. […] what are the chances that a single Aurignacian cave would contain so many different features, themes, styles and techniques which, over a hundred years of study, have become so strongly and indubitably associated with later periods? (Pettitt and Bahn 2003: 139)

Very little rock art can be attributed to the Aurignacian (or for that matter to any other period, anywhere in the world) with adequate confidence to make such sweeping claims. The conceptually most complex portable art of the Upper Palaeolithic is of the Aurignacian rather than the subsequent purported tool industries. It includes the two lion-headed therianthropes from Swabia (Hohlenstein-Stadel, Schmid 1989; and Hohle Fels, Conard et al. 2003) and the anthropomorph from Galgenberg (Bednarik 1989), so why should we be 'shocked' to observe a similar level of sophistication in Aurignacian rock art? 'Aurignacians' seem to have been somewhat interested in 'dangerous animals' and female sexuality, and these do feature prominently enough in Chauvet. Probable vulva symbols or 'pubic triangles' have been reported from Abris Blanchard, Castanet, Cellier and du Poisson, La Ferrassie, Laussel (Delluc and Delluc 1978; *contra* Bahn 1986) and now from Chauvet Cave. Also, the creation of naturalistic female statuettes of emphasised sexuality (whose form is reflected in the partial female anthropomorph on a stalactite in Chauvet's Salle du Fond) begins with the Aurignacian. Moreover, it is obvious that Chauvet comprises two art traditions, so the variety of content and techniques is also no surprise to those with an open mind.

Finally, Chauvet is certainly not alone. I have long considered the early phase of the cave art in Baume Latrone to be of the Aurignacian (which is also very complex; Bégouën 1941; Drouot 1953; Bednarik 1986). Moreover, the small corpus of l'Aldène, reflecting the principal faunal elements in the Chauvet art, was

created before the decorated passage became closed 30 260 ± 220 BP (Ambert et al. 2005: 276–7; Ambert and Guendon 2005). Other sites will no doubt be found to belong to those early traditions, and the stylistic daters will need to significantly revise their ideas of Aurignacian and other Upper Palaeolithic rock art.

It is more appropriate to ask, what are the chances that Zuechner's idea, that all of the charcoal images so far analysed in Chauvet are derived from fossil wood, is correct? Over forty carbon isotope results are now available from the site, including of charcoal from the floor. Far more likely than the involvement of fossil wood would be the use of much earlier charcoal, but that argument is not even made in respect of Chauvet, perhaps because some of the dates come from torch marks. These, importantly, are in stratigraphical sequence (separated from the earlier art phase by speleothem deposition). The possibility of a systematic error in all of these internally or stratigraphically consistent dates, implied by Pettitt and Bahn, is also specious: why should this affect all the dates from Chauvet, but none of those they are in agreement with from other sites? Their argument could be made if they presented some evidence that points to a systematic distortion at just the one site, but without such data their case remains one of *ignoratio elenchi* (mistaken refutation) or is supervenient upon the empirical data. Moreover, I would be more comfortable with the objections of Pettitt and Bahn if these authors applied the level of rigour they profess to their own Church Hole presentation (Bahn et al. 2003). Their several publications about the 'first discovery of Palaeolithic cave art in Britain' each show very different recordings of the main image, which was first introduced as a two-legged ibex image. It then became a four-legged stag (Ripoll et al. 2004), and after my critique it was substantially changed again but still remains inadequate (Ripoll et al. 2005). Most of the claimed images in Church Hole do not seem to exist, judging from the few photographs we have seen, or are merely natural features, and the argument in favour of Pleistocene age is stylistic only, with the promise of irrelevant $^{230}Th/^{234}U$ dating. This standard of reporting compares very poorly with the published data we had in hand less than a year after the discovery of Chauvet Cave about that site.

The real problems with Chauvet are not even considered by the critics of the dating attempts, who seem only concerned with salvaging a doomed stylistic chronology. One issue is of paramount importance: all carbon isotope determinations of the *European Late Pleistocene Shift* in southern Europe need to be considered sceptically, because of the effects of the Campanian Ignimbrite event and the cosmogenic radionuclide peak about a millennium earlier (Fedele et al. 2002). The best available ^{14}C determinations for the CI eruption place it between 35 600 ± 150 and 33 200 ± 600 carbon-years BP (Deino et al. 1994), but the true age of the event is more likely to be in the order of 39 280 ± 110 BP, derived from a large series (36 determinations from 18 samples) of high-precision single-crystal $^{40}Ar/^{39}Ar$ measurements (De Vivo et al. 2001). Alternatively, Fedele and Giaccio (2007) have proposed that a significant volcanogenic sulphate signal in the GISP2 ice core, occurring precisely 40 012 BP, represents the Campanian eruption. Therefore, in southern France, carbon isotope dates only marginally lower than the carbon age of the CI event may well be several millennia too low, and the true age of the early Chauvet phase could theoretically be as high as 36 000 or 38 000 BP.

On that basis alone, this rock art is more likely older than the carbon isotope results suggest, rather than much younger, as the stylists claim. Bearing in mind the evidence for intentional deposition of cave bear remains, the very clear depictions of *Ursus spelaeus* in the art and several other supporting factors, it appears the propositions made by the stylists are soundly refuted. The most probable chronological scenario is that the early phase of the Chauvet Cave was created >35 000 years ago, and several millennia later more recent human visitors added their markings and footprints. Around 24 000 years ago, the main entrance collapsed, followed by the closure of the entrance of Salle Morel some millennia later. There is complete absence of credible evidence that any of the cave's cultural traces could be of the Magdalenian, and the genre of the rock art is distinctively Aurignacian.

'Aurignacians' and the cave bear

At this point it is opportune to return to the question of the practice of depositing cave bear remains, a form of human behaviour typical of a particular time period and thus a broad indicator of age. Evidence for cultural placement of cave bear skulls and long-bones has been reported from many caves, especially in central Europe, but it is temporally restricted to the final Mousterian and Aurignacoid traditions, most notably the Olschewian (Abel 1931; Andrist et al. 1964; Bächler 1940; Bayer 1924, 1928, 1929a, 1929b, 1930; Bednarik 1993; Bégouën and Breuil 1958; Brodar 1957; Cramer 1941; Ehrenberg 1951, 1953a, 1953b, 1954, 1956, 1957, 1958, 1959, 1962, 1970; Kurtén 1968: 127; Kyrle 1931; Malez 1956, 1959, 1965; Mottl 1950; Rabeder et al. 2000; Rakovec 1967; Stehlin and Dubois 1916; Trimmel 1950; Tschumi 1949; Vértes 1951, 1955, 1959, 1965; Zotz 1939, 1944, 1951). These perceived technological traditions are both attributable to Neanderthaloid people (see below). The evidence of intentional cave bear bone deposition was unfortunately dubbed a cave bear 'cult' (Abel and Koppers 1933). While this was an over-interpretation, the evidence itself remains unrefuted, despite the endeavours of Koby (1951, 1953; Koby and Schaefer 1960) and others (e.g. Cramer 1941; Jéquier 1975).

The practice of depositing cave bear skulls and

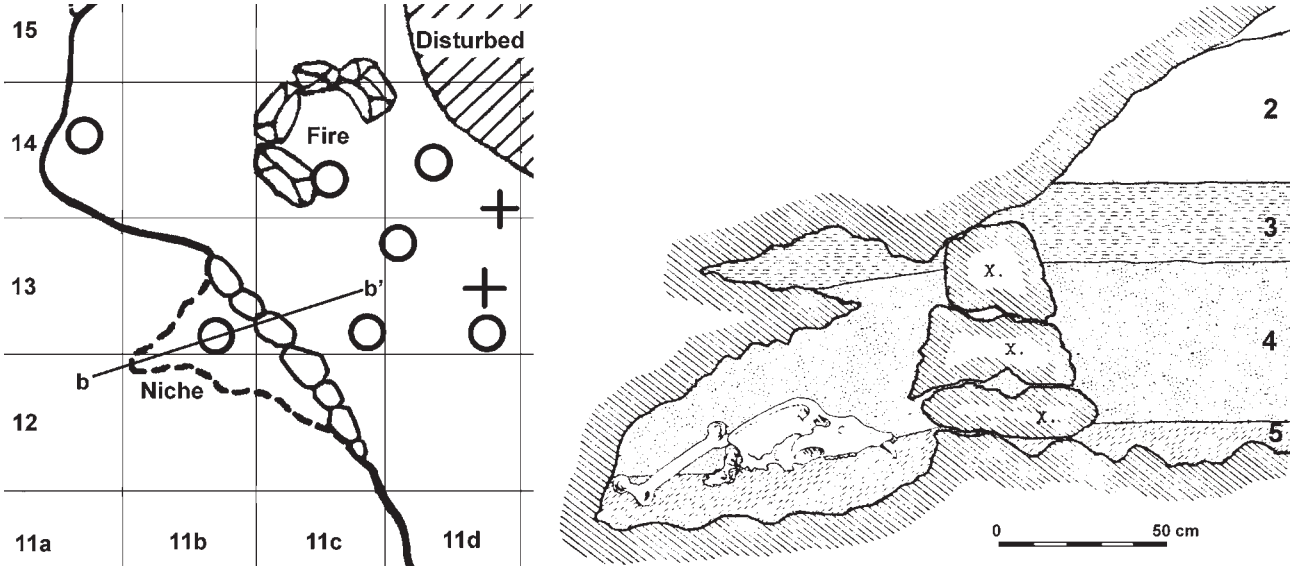

Figure 2. *Plan view (left) and section (right) of the western niche in Veternica Cave, Croatia, indicating the artificial masonry wall and other elements of the final Mousterian. The circles indicate cave bear skulls, the crosses represent human skulls (after Malez 1959).*

long-bones has been described in detail since Bächler's work in Switzerland during the 1930s. Because the 'Alpine Palaeolithic' industry he described was assigned to the Mousterian (Drachenloch >41 000 BP, Wildkirchli, Schnurenloch, Wildenmannlisloch, Chilchli Cave; Bächler 1940; confirmed by Tschumi 1949; Schmid 1958; Andrist et al. 1964), a tendency developed to attribute every similar find to the Middle Palaeolithic, despite several early objections (e.g. Zotz 1944) that most of the site occupations in question are of Early Upper Palaeolithic (EUP) traditions. In the 1950s and 1960s, over-interpretation led to rejection of the 'cave bear cult', but the work of Koby and others instrumental in it is itself marked by many errors, and there remained adequate secure evidence to re-consider the issue (Bednarik 1993).

Koby (1951) opposes the concepts of both cave bear hunters and intentional deposition of bones. The evidence refuting his first proposition includes the hornfels flake found embedded in the *os frontale* of a cave bear skull from Rotes Feld Cave (Zotz 1951: 120); charred and smashed cave bear bones in dozens of sites; the extensive evidence for hunting of the last remaining cave bear populations in the Holocene (Caucasus and northern Urals) by Mesolithic hunters specialising in this one species (Musil 1981: 10); and the 'frantic' scratch marks found in specific cave locations amenable to the placement of nooses, suggesting that the fattened and possibly drowsy animals were harvested in their hibernation haunts (Bednarik 1993). Palaeoart provides depictions such as those of two bears apparently lying on their sides, with marks at their nozzles suggesting an issuance and their bodies covered by numerous apparent piercings and arrow-like marks, in Les Trois Fréres (Bégouën and Breuil 1958; H. Bégouën reported what he regarded as intentionally deposited skulls, cf. Ehrenberg 1954: 48); a similar image from Le Portel; the near-life size clay model of a bear in the Galerie Casteret, Montespan Cave, punctured with forty-one holes; and the petroglyph of a well-detailed bear head with two lines crossing the neck in a manner suggesting severance of the head, in Pech Merle (Lemozi 1929). In all, there are presently seventeen known 'bear hunting images' in Palaeolithic rock art (Morel and Garcia 2002), but none can be demonstrated to depict cave bears.

Among the sites that have provided apparently sound evidence for intentional deposition of bones are Drachenloch (Bächler 1940), Reyersdorfer Cave (Zotz 1939), Veternica Cave (Malez 1956, 1959, 1965) and possibly Salzofen Cave (Ehrenberg 1951 et passim; Trimmel 1950; Schmid 1957; ~34 000 BP). Leroi-Gourhan (1947) reports the striking positioning of ten bear skulls in the Caverne des Furtins, and there are similar finds in the Hungarian caves Homoródalm ser, Istállóskö (Vértes 1951, 1955) and Kölyuk Caves (Vértes 1959: 160–2), and in Mornowa Cave (Brodar 1957: 154–5; Zotz 1944: 29).

The most persuasive evidence, in my view, is provided by the several apparent depositions in Veternica Cave, 9 km west of Zagreb. Malez excavated sixty-three skulls and several hearths from the late Mousterian horizon of this relatively small cave. Along a wall 11 m from the entrance, six cave bear skulls were neatly arranged in a row, all with their occipitals resting against the wall and their snouts facing the cave entrance. A nearby skull and two mandibles showed extensive anthropic modification: all teeth and some other parts (*processus coronoideus* and *p. condyloideus*) had been removed by impact (some broken roots remained in the alveolar

recesses), and many edges were modified by abrasion and polishing. One of the mandibles bears three man-made holes — Malez explicitly excludes the possibility that they are canine impressions. Such perforated cave bear mandibles, of which there are three in Veternica, have also been reported from Potočka Cave, a typical Olschewian site (Brodar 1938: 153), and from Drachenloch, Mokriška Cave and sites in Silesia (Zotz 1939: 27). Two other finds of deposited cave bear remains in Veternica are more persuasive. After completion of the excavation, Malez noted that a 2-m-long part of the west wall was not of bedrock, but had been artificially built. After removing the masonry wall he found a small niche, filled by the same strata as the space outside (Fig. 2). He recovered a femur and cave bear skull facing the entrance, resting on the lowest sediment and coinciding with the late Mousterian occupation. On the opposite wall, just 5 m away, he had already excavated a similar niche, containing a skull flanked by two femurs, apparently of the same animal. A 1-m boulder had been used to close the entrance of the small recess completely (Fig. 3). The male skull it contained was the largest found in the entire cave, and accompanied by two mandibles. One of them had been extensively modified and perforated. Finally, at a fire place only one metre from the first niche, a cave bear skull, partially calcined, was found resting against the charcoal, together with four apparently arranged boulders surrounding the fire remains (Fig. 4). Various other cave bear bones in the site were also modified or charred.

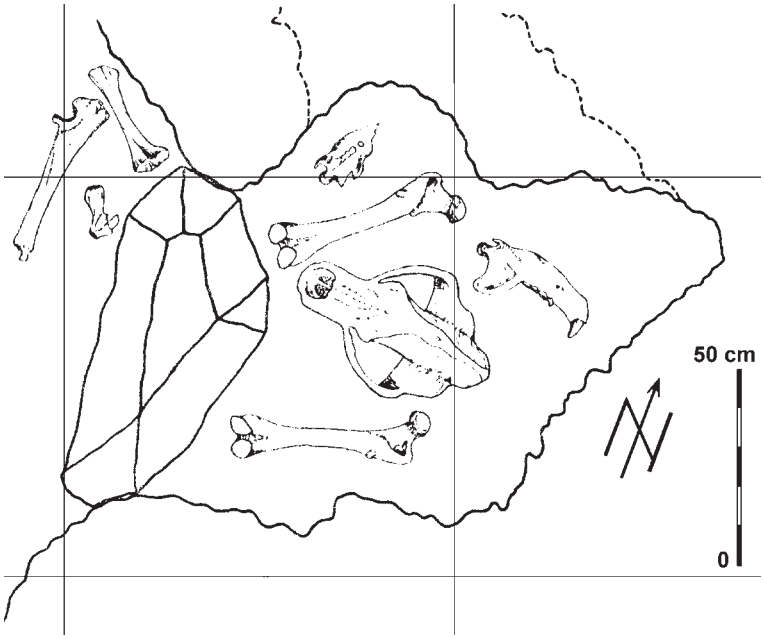

Figure 3. *Plan view of the eastern niche in Veternica Cave, indicating the locations of the cave bear bones within and in front of it, and the large boulder sealing it (after Malez 1959).*

The considerable body of evidence offered for the practice of intentional deposition of cave bear remains in the final Mousterian and EUP has been subjected to various refutation attempts, none of which produced decisive counterarguments. In reviewing the evidence in the year before the discovery of Chauvet Cave, I therefore arrived at the conclusion that the neglect of the issue in recent decades was unwarranted (Bednarik 1993). Neither side in the debate had produced conclusive evidence. On the one hand, over-interpretation of scanty evidence had certainly occurred, and it must be appreciated that the enormous deposits of cave bear remains in European caves are largely natural features. But on the other hand, the opponents of the idea had also erred in many aspects I listed, and had failed to falsify the proposition.

Chauvet Cave provides an opportunity to test the idea of intentional positioning of cave bear remains. Its preservation is impeccable, both in the sense that the floors have been so perfectly maintained, and in the sense that researchers have avoided all damage to this incredibly well preserved site. The extensive floor area of approximately 20000 square metres yielded 190 skulls of *Ursus spelaeus*, most of which occur in compact accumulations. Some remains occur in articulation, apparently where individuals died in situ. However, the frequent occurrence of skulls in specific locations is conspicuous, and in some skulls the canines and incisors have been removed. Most occur in upright position, and one has been placed in a prominent location. It is perched on the edge of the upper horizontal surface of a conspicuous,

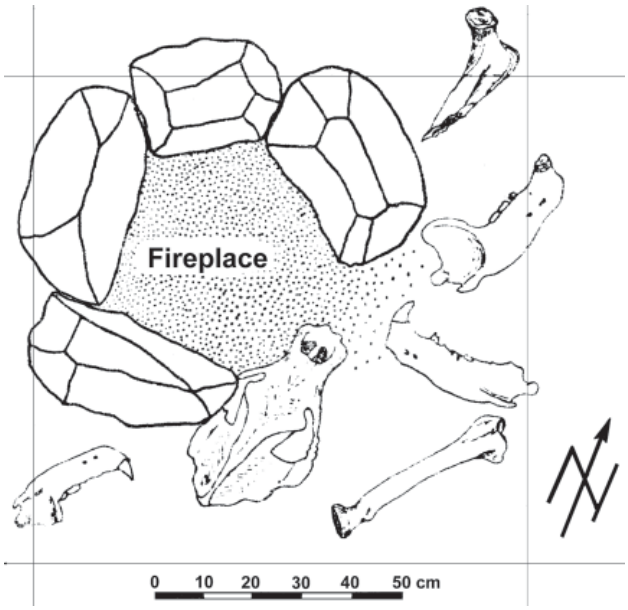

Figure 4. *Detail of the fireplace in Figure 1a, showing the locations of cave bear mandibles and a skull (after Malez 1959).*

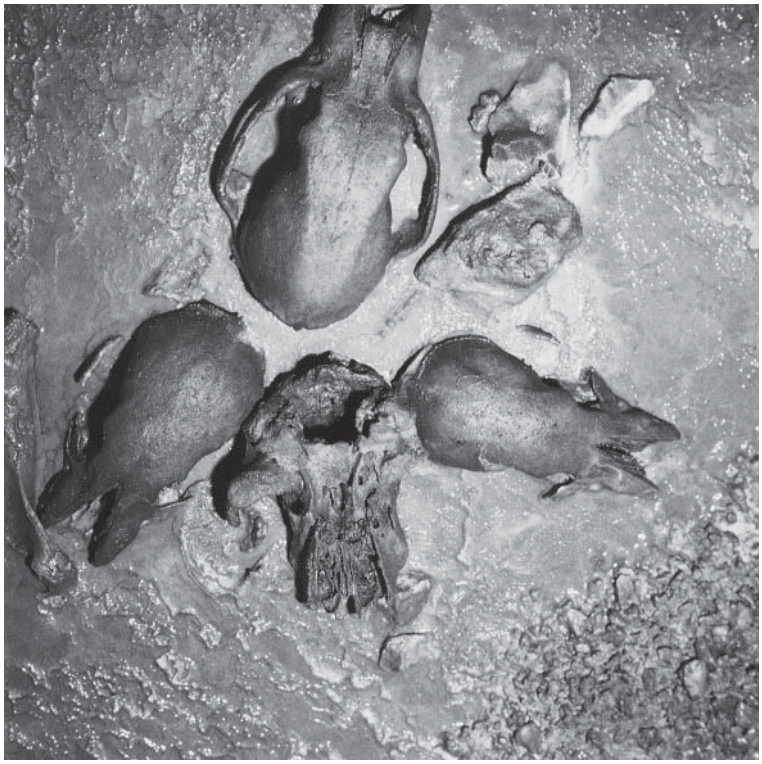

Figure 5. *Possibly intentional arrangement of four cave bear skulls on the floor of Piatra Altarului, Romania (photograph by Cristian Lascu).*

table-like boulder in the Salle du Crâne. The angular block originates from the ceiling, 5 or 6 m higher, from where it fell, as did five others that are lying around the largest fragment. This rock remains in the same orientation as it was on the ceiling, i.e. the horizontal fracture surface formed when it was claimed by gravity came to form the flat top of the 'table', and its narrow base is stuck in the cave floor. It now protrudes about 70 cm above the floor, which has remained as it was at least 24 000 years ago. This prominent feature is located about 6 m west of the famous horse panel, among a collection of fifty-two further cave bear skulls on the floor, most of them surrounding this boulder. Underneath the elevated skull, which was indisputably placed on this 'table' by humans, occur charcoal fragments, probably from torches. The skull, slightly smaller than most others, rests with its premolars on the edge of the block, its canines pointing down (cf. Clottes 2001: Figs 202, 203).

There are two other clear examples of deposited cave bear bones in Chauvet, both found in the Salle des Bauges. This is a very large hall near the original entrance, containing only four skulls (Fig. 1). In two cases, about 10 m apart and perhaps 30 to 40 m from the former, now collapsed entrance, occurs the combination of a cave bear skull with a cave bear humerus. In both cases the skulls are placed upright, and the humeri have been inserted into the ground perfectly vertically, at least half submerged in the sediment. In one case the long-bone is located close to the skull, in the other it is about a metre away, but precisely aligned with its longitudinal axis and in front of it. There are no other bones in the vicinity. In both cases the surrounding surface is entirely of fine-grained sediment and fairly flat. Fluviatile action is not indicated, though the area appears to have been submerged under a shallow pond occasionally. It is extremely unlikely that these two placements are random, natural effects; the two humeri are the only elongate bones in the cave orientated vertically. If there had been fluviatile turbulence, none of the other floor evidence (tracks, scratch marks) would have survived. Water flow is of supercharged calcite solution forming flowstone, and derives from specific locations easily identifiable (I witnessed an episode of water ingress after heavy rains).

Another recent discovery of positioned cave bear skulls has been reported from Piatra Altarului (Altar Cave), one of a system of six caves in the Bihor Mountains in north-western Romania. The cave, over 3 km long, was only discovered in 1986. It was later found to contain at least two apparently deposited skulls with long-bones, both heavily calcified, and an apparent symmetrical arrangement of four skulls, one large and three smaller (Fig. 5).

The apparent features noted in respect of modification or placement of cave bear remains can be summarised thus:

1. In numerous sites, bone accumulations, especially of skulls, are evident. No similar features have been observed in the occurrence of the remains of any other species. Selection by sedimentary or fluvial transport is in many cases unlikely, and it would need to be explained why random natural processes would select the skulls of just one species.
2. Many of these skulls seem to have been placed intentionally, often together with long-bones of the same individual.
3. Where anthropic modifications of cave bear skulls and mandibles have been reported, the removal of teeth and perforations are often observed.
4. Skulls that have been suggested to have been orientated intentionally most often face the entrance, and other forms of apparent alignment have been observed.
5. No such phenomena have been reported from any cave bear hibernation site that lacks human occupation evidence. They occur typically in caves with extensive anthropic traces, such as fire use, stone tools and cave art.

Concerning the last point, it needs to be

Figure 6. *Mladeč 1, 6 and 5, Czech Republic. The morphological differences between the two females (on left) and the male are striking. (To facilitate comparison, all specimens in Figures 6 to 9 are shown facing the same direction, irrespective of whether left or right aspects are shown.)*

appreciated that sites containing the remains of hundreds of thousands of cave bears are available for comparison. A case in point is the Drachenhöhle in Styria (Abel 1931), which has yielded some 250 000 kg of their bones, yet not a single instance of intentional deposition has been reported. In Chauvet Cave, numerous articulated skeletal remains indicate where animals perished, while other groups of surface bones are largely or exclusively of whole skulls. These lack wear from water transport or carnivore activity, and unless a more plausible explanation of how such accumulations could form naturally, and comprise the crania of just one species, Occam's razor would suggest the direct involvement of humans. In view of the other phenomena listed, which demand an anthropic explanation, it should be considered that the people of the final Mousterian and the EUP followed a cultural practice of treating selected bones of the cave bear in certain specific ways. To refute the proposition, credible natural processes to account for all the described phenomena need to be presented.

The question of authorship

The second important issue to be considered here follows on from the acceptance that the Chauvet rock art was made at the time of the Aurignacian. This raises the question: what kind of people produced it? Who were the humans we rather simplistically call the 'Aurignacians'? Traditionally it has always been assumed that they were anatomically modern people, and for the past few decades that they derived from an intrusive population invading Europe from Africa around 40 000 to 30 000 years ago. Now that the only securely dated 'relatively modern' (partially gracile, but not yet anatomically modern) human remains in Europe are 27 700 years or younger (Henry-Gambier 2002), earlier populations are probably of more or less robust *Homo sapiens* types (including Neanderthaloids). The entire issue of dating nearly all Würmian human remains from Europe has undergone incredible changes in just the last few years. For instance, the sensational exposure of all datings by Professor R. Protsch as fraudulent means that there are now no post-Neanderthal remains known in Germany that are more than 18 600 years old (Terberger and Street 2003; Schulz 2004). The recently dated Mladeč fossils from the Czech Republic (Fig. 6), between 26 330 and 31 500 carbon years old (Wild et al. 2005), lack credible stratigraphic provenience (Bednarik 2006) and are not modern, but are intermediate between robust and gracile *Homo sapiens* (Smith 1982, 1985; Frayer 1986; Trinkaus and Le May 1982; Jelínek et al. 2005). The same applies to some degree to the Cro-Magnon specimens (Fig. 7), which in any case now appear to be of the Gravettian rather than the Aurignacian (Henry-Gambier 2002). The similarly ambiguous Peştera cu Oase mandible (Trinkaus et al. 2003) and the subsequently found cranium (Rougier et al. 2007), from a different part of the same large Romanian cave, are thought to be in the order of 35 000 years old. They are both without archaeological context and also neither anatomically modern nor typically Neanderthal. Much the same applies to the six human bones recently dated to about 30 000 years from another Romanian cave, Peştera Muierii (Fig. 8),

Figure 7. *One of the Cro-Magnon specimens, France, attributed to the Aurignacian; they are in fact all of the Gravettian.*

Figure 8. *Peştera Muierii skull, combining robust and gracile features, c. 30,000* BP.

Figure 9. *Stetten 1, from Vogelherd, Germany, attributed to the Aurignacian; the Stetten human remains are in fact all of the late Neolithic.*

also clearly intermediate between robust and gracile Europeans (Soficaru et al. 2006). The four specimens from Vogelherd, however, are anatomically modern (Czarnetzki 1983: 231; Gieseler 1974), but their claimed age of 32 000 years has now been rejected convincingly: they are Neolithic (Fig. 9) and are all between 3980 and 4995 years old (Conard et al. 2004). The 'Neanderthaloid' Hahnöfersand skull, formerly 36 300 years old (Bräuer 1980), is now a 'Neanderthal' of the Mesolithic, at only about 7500 years (Terberger and Street 2003), and the Paderborn-Sande skull, also dated by Protsch, is not 27 400 years (Henke and Protsch 1978), but only 238 years old. The Binshof cranial fragment is no longer 21 300 years old, but only 3090 ± 45 carbon years (Terberger and Street 2003), and similar reductions apply to the two individuals from the Urdhöhle and the Kelsterbach skull. Another specimen often cited by the African Eve advocates as an early modern (though still fairly robust individual) is from Velika Pećina, now safely dated to about 5045 carbon years (Smith et al. 1999).

When we add to this list the remaining French specimens from the period, we realise the extent of the issue. 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 attributed to the Châtelperronian levels; Klaatsch and Hauser 1910) are thought to be of Holocene burials (Perpère 1971; Asmus 1964). 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 mandibular fragment from Isturitz and the two juvenile mandibles from Les Rois range from robust to very robust. Just as the Cro-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 (as do many other intermediate specimens) but the site's juvenile mandibular fragment is robust. 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.

There are now virtually no 'anatomically modern' specimens known from Europe prior to the Gravettian and contemporary traditions (for a more comprehensive discussion see Bednarik 2007), and even those of the Gravettian are still relatively robust. However, there are numerous Neanderthaloid finds up to the beginning of the Gravettian, around 28 000 years BP. In six cases, Neanderthal remains have now been reported in occupation layers containing the tools of early Upper Palaeolithic traditions: from the Châtelperronian of Saint Césaire and Arcy-sur-Cure (both France), from the Aurignacian at Trou de l'Abîme (Belgium), the Olschewian in Vindija Cave (Croatia), the Streletsian at Sungir' (Russia), and from the Jankovichian found in Máriaremete Upper Cave (Hungary) (Smith and Raynard 1980; Wolpoff et al. 1981; Frayer et al. 1993; Gábori-Csánk 1993; Wolpoff 1999; Smith et al. 1999; Ahern et al. 2004).

We have therefore 'Neanderthals' and 'post-Neanderthals' from the period 45 000 to 28 000 years ago, and we have less robust remains from the subsequent millennia. This suggests, firstly, that all Early Upper Palaeolithic traditions were by Neanderthaloids, and secondly, that full anatomical modernity did not appear at any specific time, but emerged gradually. The trend towards gracility first becomes evident roughly around 50 000 years ago, and it continues still in the Holocene, right up to the present time. European humans 10 000 years ago were about 10% more robust than present

Europeans, those of 20 000 years ago were 20% more robust and so on. There was no sudden reduction in robusticity at any point in time, hence no wholesale replacement of the robust populations is indicated by the skeletal evidence. Neanderthaloid specimens are still common in the early Holocene, those from Drigge (Terberger 1998) and Hahnöfersand being two examples, and they occur still today. The claims made about very fragmentary DNA sequences from Neanderthal bones were seriously misleading, for at least two reasons. Gutierrez et al. (2002) have shown 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. Moreover, the results presented from the Neander valley remains are probably irrelevant. Pruvost et al. (2007) have recently reported that DNA deteriorates rapidly after excavation, up to fifty times as fast as in buried specimens. A large part, on average 85%, of the genetic material preserved in fossils is lost as a result of treatment by archaeologists and storage in museums, therefore the results disseminated from these specimens and their interpretations need to be questioned. More reliable are genetic studies of living populations, which have shown that both Europeans and Africans have retained significant alleles from multiple robust populations (Hardy et al. 2005; Garrigan et al. 2005; cf. Templeton 2005). In fact, the Neanderthal genome seems to include an excess of human-derived single nucleotide polymorphisms (Green et al. 2006). At least 25% of the ancestors of later Upper Palaeolithic people would need to be Neanderthals to account for the preservation of Neanderthal 'autapomorphies' observed (Hawks 1997; see also Frayer 1993, 1998; Frayer et al. 1994).

In short, modern Europeans are descended from Neanderthals, and at the time the art in Chauvet Cave was produced, their ancestors were far too robust to be described as anatomically modern.

Discussion

Precisely the same gradual change we see in human skeletal characteristics is found in the complex mosaic of the European tool traditions from 45 000 to 30 000 BP. As the house of cards built by the 'African Eve' advocates collapses, they have to prepare themselves for the possibility that not only the Aurignacian proper, but also the Bohunician, the Szeletian, the Olschewian (which I consider highly relevant to Chauvet), the Jankovichian, the Bachokirian, the Uluzzian, the Uluzzo-Aurignacian, the Proto-Aurignacian and the Altmühlian might all relate to humans other than their so-called 'moderns'. After pointing out many years ago (Bednarik 1995b: 627) that we have no evidence whatsoever that the Early Aurignacian is the work of 'moderns', I can now add that the ethnicity of the makers of *any stone tool tradition of the entire first half of the so-called Upper Palaeolithic* — including the entire Aurignacian — appears to be that of robust, Neanderthal-like humans, or of their direct descendants.

The now absurd 'African Eve' or replacement model (Stringer and Andrews 1988) was derived from the 'Afro-European *sapiens'* model (Bräuer 1984: 158), which in turn was based on the fake datings of Protsch. Therefore, the now unravelling paradigm was initiated by academic fraud. The replacement model, which demands complete genetic isolation of the invading Africans and the resident robusts, has been refuted, and those models that admit hybridisation between the two hypothetical populations are in reality local versions of the Multiregional Theory that merely claim a strong inflow of African genes (Relethford 2001; Relethford and Jorde 1999). 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), and not by cranial architecture or other minor physical differences.

I find it of the greatest concern that archaeology and palaeoanthropology have been entirely ineffective in tackling the most important issue in recent hominin evolution: why did humans of the last third of the Late Pleistocene develop into inferior forms not only in Europe, but in all four continents occupied at the time? Why was the trend towards increasing robusticity, such as we see in the australopithecines and much later again in robust *Homo sapiens*, suddenly reversed and led to rapidly increasing gracility in the final Pleistocene? Why did our brain size, skeletal robustness and muscle power all decrease so swiftly and so uniformly around the globe, resulting in selection for so many neonate and neotenous features that I would not even begin to list them here (but see Bednarik in prep.)? This is the key question to answer in human evolution, and yet it has not attracted any attention whatsoever. A discipline that is so blinkered by a false paradigm that it fails to consider even the most important issue it faces is not a science; it is a mythology, a belief system.

Genetic drift (allele drift based on generational mating site distance; Harpending et al. 1998) and introgressive hybridisation can easily account for the anatomical changes we see in Europe during what is called the Early Upper Palaeolithic. A sharp reduction in gene pool size is the most effective factor in the acceleration of phylogenetic change in a population, and may well have accompanied the catastrophic Campanian Ignimbrite event and the immediately subsequent Heinrich 4 climatic event (Fedele and Giaccio 2007). Such a bottleneck would have been particularly effective if combined with genetic drift or introgression across contiguous populations subjected to demographic adjustments.

Figure 10. *Footprint of a child in Chauvet Cave, apparently of a Neanderthaloid individual.*

Such processes can even account for the rapid physical change (within 20 or 30 millennia) and for its universal occurrence in all human populations of the time. But there is one aspect for which evolution cannot account satisfactorily: the neotenous nature of anatomically modern humans, the rapid and significant diminution of such features as a large brain, thick skull, robust skeleton, pronounced muscle attachments and sheer physical body strength. This universal process of gracilisation in four continents cannot be explained in evolutionary terms, it runs counter to all we know about natural selection, and it occurred in a short time.

Only the laws of Gregor Mendel can suspend Darwinism, and I propose that this is what occurred. The advent of the so-called Upper Palaeolithic is not just marked by the appearance of certain technological traits, but also by culture (in the scientific and not the archaeological sense) gaining so much influence on human behaviour that it shaped conscious choices about evolutionarily irrelevant values such as 'aesthetics'. This is readily evident from the 'archaeological record'. The most consequential of these conscious choices was mate selection, which gradually became guided by cultural constructs, such as social position, communication ability, body adornment, and most particularly physical attractiveness. The process is particularly well illustrated by the Czech hominins from 32 000 to 26 000 BP (Bednarik in prep.), where the female specimens are consistently far more gracile than the still very robust males (Fig. 6), suggesting that gracilisation first occurred in the females. This reversal of encephalisation and evolutionary fitness only became possible through the ascent of culturally structured society. While the brain of all mammals and birds is hardwired to react in a nurturing fashion to neonate features, the cultural preference for neoteny in recent hominin development is probably attributable to conscious selection of specific physical features in mating preferences. In other words, culture intervened in evolution, and the anatomically modern, extensively foetalised humans are the product of selective breeding: they 'domesticated' themselves, albeit unintentionally. (The details of this '*domestication hypothesis*', which is offered in lieu of the defunct 'replacement hypothesis', will be presented elsewhere.)

Robust *Homo sapiens*, such as Neanderthals, are universally considered to be intellectually inferior to contemporary humans, an attitude that is the phylogenetic equivalent of traditional European or other ethnocentric notions of superiority, which have been used so extensively to justify colonialism and genocide. We have not one iota of evidence that late Neanderthals were less intelligent than we like to think we are. There is the possibility that they were more intelligent than we are, at least in some aspects, because they had significantly larger brains.

We can now add to this notion the observation that the world's most stunning cave art, that of Chauvet Cave, appears to be the work of robust *H. sapiens*. Besides the most sophisticated rock art we know of, this cave also features thousands of human and animal tracks on its floor (in the Salle des Bauges, Salle du Crâne and Galerie des Croisillions; see Fig. 1). Some of these are exceedingly well preserved (cf. Clottes 2001: Fig. 28), and in examining them closely, I considered that they appear to be of Neanderthaloids rather than 'anatomically modern humans'. 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 'Cro-Magnon remains (often paraded as typical 'moderns') as well as footprints. This may of course be coincidence, both versions can be found among modern Europeans. However, in the case of the supposedly 8 to 10-year-old child that strode though the cave, the second toe is not only longer, it is offset above its two neighbours. In a child not used to wearing tight footwear, this might be a diagnostic feature (Fig. 10). Moreover, the Chauvet tracks also show other characteristics that differ from most modern human tracks. The ratio of the widths across heel and front of foot is markedly greater, and more pressure has been applied to the outside margin, which is perfectly straight. This suggests a somewhat bow-legged gait, which may be

more consistent with robust skeletal evidence.

On the present evidence available to us, the initial artists of Chauvet Cave (or at Vogelherd, for that matter, or the bead makers of Kostenki 17) are more likely to have been people of Neanderthaloid features than anatomically modern. This is indicated by the categorical finding that all Early Upper Palaeolithic technological traditions precede the appearance of these 'moderns', and perhaps even by the ichnological evidence in Chauvet. Naturally, the presence of 'Neanderthal' footprints does not prove that the rock art was also made by these people, but surely the possibility needs to be seriously considered. The traditional response, that the Neanderthals could have never been sufficiently advanced to produce such masterworks, is simply no longer adequate now that all of the Aurignacian appears to be a 'Neanderthal' tradition.

European Pleistocene archaeologists need to adjust to this new scenario, and unless they can demonstrate that Chauvet was made by what they call 'moderns' or 'Cro-Magnons', they are obliged to fairly consider the possibility that this art is the work either of Neanderthals or of their descendants who experienced genetic drift rather than 'replacement', and whose breeding patterns were influenced by cultural selection: selection in favour of neotenous features. Based on the present archaeological and palaeoanthropological evidence, the latter scenario is the more likely: we have Neanderthal remains from the time of Chauvet, and we have no 'moderns'. Science works by falsification, and the proposition to be tested now is that the Chauvet art was created *not by 'moderns'*. The proposition of its Aurignacian age, too, can be tested — but not by facile and circular stylistic argument as has been proposed by Zuechner (1996) and Pettitt and Bahn (2003).

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