

# Neanderthal symbolism and ornament manufacture: The bursting of a bubble?

Paul Mellars

Department of Archaeology, Cambridge University, Cambridge CB2 3DZ, United Kingdom

For the past 40 y, the range of grooved and perforated animal teeth, mammoth-ivory rings, and other unmistakably “decorative” or “ornamental” items discovered during the excavations in the Châtelperronian levels in the cave of Grotte du Renne in north central France (1–4) (Fig. 1) have played a pivotal role in discussions of the European Neanderthal populations, suggesting that these populations were actively engaged in a range of highly “symbolic” behaviors, which had previously been generally regarded as culturally and behaviorally diagnostic of the earliest *Homo sapiens* populations, who are known to have dispersed rapidly across Europe (from their ultimately African origins) between ca. 45,000 and 35,000 y ago (5–9). Despite being effectively unique in the archaeological records of the European Neanderthals, the finds have often been taken to demonstrate that the Neanderthals possessed highly symbolic cultural and cognitive capacities (including language) closely similar if not identical to those of the ensuing “modern” human populations (10–13).

The PNAS article by Higham et al. (14) has now thrown substantial doubt on these anatomical and cultural associations at the Grotte du Renne site, based on an intensive campaign of radiocarbon accelerator dating measurements by the highly respected Oxford Radiocarbon Accelerator Unit. These measurements demonstrate that the archaeological and faunal material originally recovered from the critical (presumed final Neanderthal) Châtelperronian levels span an extraordinarily wide range of ages (ranging between ca. 49,000 and 21,000 y B.P. in radiocarbon terms), which can only be explained by a substantial degree of stratigraphic mixing of materials from several adjacent archaeological levels that occurred either during the original excavations on the site in the 1950s or as a result of earlier geological or human disturbance of the deposits. As the dates themselves reveal, a significant proportion of the newly dated bone samples from these critical Châtelperronian levels almost certainly derive from the immediately overlying “Proto-Aurignacian” level on the site, now reliably dated by the new radiocarbon measurements to approximately 35,000 y B.P., and generally agreed to be the product of the earliest anatomically mod-



Fig. 1. Grooved and perforated “personal ornaments” and ivory ring from the Châtelperronian levels at the Grotte du Renne, France. [Reproduced with permission from Randall White, New York University, New York.]

ern populations in western Europe (5–7, 15–19). Although for technical and administrative reasons it was not possible to secure any dates directly on the ornamental items themselves, the results raise the strong possibility—if not probability—that they were stratigraphically intrusive into the Châtelperronian deposits from these overlying Proto-Aurignacian levels—an option already suggested by a number of earlier workers on stratigraphic grounds (2). One could perhaps raise similar questions as to the provenance of some of the diagnostically Neanderthal skeletal remains (including 29 teeth and a temporal bone) recovered from the same Châtelperronian levels (3, 4), but on the basis of the dated radiocarbon samples, there is much less evidence for intermixture of material from the underlying “Mousterian” levels in the sequence (with the exception of a single date of  $48,700 \pm 3,600$  y B.P.), which makes the doubts sometimes raised as to the provenance of the remains (19) much less plausible on both stratigraphic and radiocarbon grounds.

Exactly what implications these results have for our current perceptions of the nature of any social or cultural relationships between the final Neanderthal populations of western Europe and the incoming anatomically modern human populations is, perhaps, more open to debate. As several authors have pointed out (20–23), the case for thinking that the highly distinctive Châtelperronian industries were manufactured by the final Neanderthal populations in western Europe hinges not only on the Neanderthal skeletal remains recovered from the Grotte du Renne (and those from the equally contested site of Saint-Césaire in southwestern France), but also on several of the specific archaeological features of

the Châtelperronian industries themselves, and in particular on their demonstrably strong links with the final Mousterian technologies of western France belonging to the so-called “Mousterian of Acheulian tradition” group, for which the direct Neanderthal associations have never been seriously contested (22). Even without the support of the disputed skeletal remains from the Châtelperronian levels at both the Grotte du Renne and Saint-Césaire, few authors now dispute that the makers of the Châtelperronian industry in western Europe were indeed the direct descendants of the immediately preceding Neanderthal populations, who are known to have occupied effectively all regions of Europe for the preceding 200,000 to 250,000 y (7, 10–12, 17–24).

The question of whether the (final Neanderthal) Châtelperronian populations ever manufactured the hauntingly “modern”-looking animal-tooth pendants, either at the Grotte du Renne or at any other sites in western Europe, is perhaps more debatable. The only other claims for animal-tooth pendants (or any similar decorative items) in association with approximately 40 known Châtelperronian sites in France and northern Spain come from the site of Quinçay (2, 10, 24), where [as Higham et al. (14) point out] the associated archaeological and stratigraphic evidence has never been adequately published, and where the objects in question might again be intrusive from the overlying levels on the site. On a more positive note, perhaps, the Oxford team did succeed in securing clear radiocarbon measurements on two morphologically simple but unmistakably shaped bone awls from the Châtelperronian levels at Grotte du Renne, which demonstrate unambiguously that the Châtelperronian groups were involved in the manufacture of these simple, shaped bone tools from at least ca. 37,000 y B.P. onward, arguably making these tools the earliest clear evidence for systematically shaped bone tool manufacture in western Europe, and apparently surpassing anything demonstrably produced by the preceding Neanderthals (11, 12).

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E-mail: pam59@cam.ac.uk.

In the light of all this new evidence, the debates over the cultural capacities of the late Neanderthal populations in Europe, and their social and cultural interactions with the incoming anatomically modern populations, will no doubt rumble on. Two scenarios have been postulated in the earlier literature. The first is that the late Neanderthal populations across Europe could conceivably have independently “invented” several features of distinctively “modern” human culture—including the production of both highly shaped bone tools and explicitly “symbolic” ornamental items—without any connection or cultural input from the incoming modern human populations, who are known to have been dispersing progressively across Europe at precisely the same time as the allegedly “independent” Neanderthal innovations (10–13), a scenario that has been described elsewhere as a seemingly “impossible coincidence” (23). The second scenario is that certain features of distinctively modern human culture and technology could simply have been dispersed by interpopulation cultural contacts and exchange mechanisms between the final Neanderthals and incoming modern human groups during the actual process of modern human expansion from east to west across the continent (5, 10, 18, 21, 23)—a process that could be described as a cultural “bow-wave diffusion” or “acculturation” model (23).

These debates will no doubt continue, especially in the wake of the recently claimed genetic evidence for a small degree (approximately 1–4%) of demographic and genetic interbreeding between the Neanderthals and the earliest genetically modern populations in Eurasia (9). However, the central and inescapable implication of the new dating results

from the Grotte du Renne is that the single most impressive and hitherto widely cited pillar of evidence for the presence of complex “symbolic” behavior among the late Neanderthal populations in Europe has now effectively collapsed. Whether any further evidence of advanced, explicitly

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symbolic behavior of this kind can be reliably claimed from any other Neanderthal sites in Europe is still a matter of debate (13, 21). One crucial question that must inevitably be posed in this context is why, if the use of explicitly symbolic behavior was an integral part of the cultural and behavioral repertoire of the European Neanderthals, there is so little actual (or even claimed) evidence for this across the 250,000-y time span of the Neanderthal occupation in Europe, extending across a wide range of sharply contrasting environments, and over a geographical span of more than 2,000 miles (21). This in turn raises questions as to not only the actual cultural repertoire of the European Neanderthals, but also (inevitably) their innate cultural and cognitive capacities for advanced symbolic thinking, including, perhaps, the capacities for fully developed

language (25). One could equally ask in this context why a population that had become so thoroughly and successfully “adapted” to the glacial conditions of Europe over a span of more than 200,000 y should have succumbed so rapidly (within a period of a few thousand years) to demographic competition from the newly arrived modern human populations, who had developed all of their biological, technological, and other cultural adaptations in the vastly different environments of sub-Saharan Africa (8, 9). If the evolutionary lineages that led to the Neanderthal populations in Europe and the anatomically and genetically modern (*H. sapiens*) populations in Africa initially diverged at least 350,000 y ago [as all of the recent genetic evidence strongly suggests (8, 9)], this would amount cumulatively to at least 700,000 y of separate evolutionary development in the two regions—arguably providing ample time for significantly different cognitive and other biological adaptations and associated genetic mutations to have occurred within the two geographically and demographically separated populations [a conclusion already strongly hinted at in the draft Neanderthal genome study reported recently by Green et al. (9)]. Clearly, one should be cautious about pressing the evolutionary and cognitive implications of all this too far. But one must confront the possibility that the human evolutionary implications of the new dating of the Grotte du Renne sequence are potentially even more significant and far-reaching than the (admirably cautiously expressed) conclusions advanced in the paper by Higham et al. (14) would suggest.

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