PERSONAL ORNAMENTS IN THE EARLY UPPER PALEOLITHIC OF WESTERN EURASIA: AN EVALUATION OF THE RECORD

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Abstract

The earliest occurrences of personal ornaments in Western Eurasia are known from assemblages that are placed at the Middle to Upper Paleolithic Transition (Chatelperronian, Uluzzian, Blattspitzengruppen, Bachokirian). However, the paucity of sites dating to this period which have produced such ornaments, the often doubtful contextual association of the finds, and the limited number of personal ornaments known to date from this period, bring into question their utilization prior to the Protoaurignacian.

In contrast, personal ornaments are a regular component of Aurignacian assemblages, showing a broad spectrum of form, raw material and techniques of attachment. In this paper we argue that personal ornaments did not occur in Europe before about 38.0 ka

INTRODUCTION

The first evidence of symbolic behavior among hominins has repeatedly been addressed by prehistorians during the last decade (see e.g., Bednarik, 1998; Lorblanchet, 1999; d’Errico et al., 2003; Hovers et al., 2003; Álvarez Fernández, 2006, in press; Zilhão, 2007; Jöris et al., in press). Personal ornaments and pendants are the most characteristic artifacts that help to trace human symbolic behavior. They are made from a variety of materials, sometimes ornamented or stained with pigments, and they are frequently found in archaeological contexts. These objects are regularly prepared for suspension as indicated by the high frequency of perforations and grooves. The “perforation” may sometimes be a natural hole, providing a simple means for suspension. However, their recognition as suspended objects of adornment (SOA) is not always straightforward, as traces left by the process of perforation or use-wear of suspension are not always well preserved.

The earliest securely dated evidence of the manufacture and use of SOA comes from North Africa. A total of 13 perforated gastropods belonging to the species Nassarius gibbosulus were found in levels ascribed to the Middle Stone Age (MSA) at Grotte des Pigeons (Taforat, Morocco) dated to about 82,000 BP

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largely unknown chronology of the Aterian and doubts as to the age of layer B at Skuhl (Zilhão, 2007). Nevertheless, both sites can be assigned to OIS5.

Perforated shells (mainly Arcularia gibbosula and Columbella rustica) are recorded in high frequencies from the Near Eastern sites of Üçagizli (Levels G–H–I), Turkey (Kuhn et al., 2001; Stiner, 2003), and Ksar ʿAkil (Level XXI–XXIV), Lebanon (Kuhn et al., 2001), both attributed to the Initial Upper Paleolithic (IUP). A single, double-perforated marine shell (Columbellidae sp.) of similar age is recorded from the Early Upper Paleolithic (EUP) level IVb at Kostenki 14 (Markina Gora) (Anikovich et al., 2007). As regards Central Asia, the oldest SOA come from the sites of Dörölj 1 (Mongolia), where beads made of ostrich egg shells have been reported (Jaubert et al., 2004), and Kara Bom (Russia) in the Altai region, where a perforated bovine tooth and several perforated bones were found (Derevianko and Rybin, 2003). Both sites have been ascribed to the EUP.

THE EARliest evidence of symbolic behavior in western Eurasia

Earliest evidence of symbolic behavior?

At a variety of European sites evidence indicates that Neandertals collected fossil and recent molluscs. In all cases, none of the shells display any artificial perforations. Knapped cobbles with fossils and marine molluscs used for the manufacture of artifacts in Italy during the Middle Paleolithic (e.g., Lorblanchet, 1999; Stiner, 1994) have repeatedly been interpreted as evidence for Neandertals collecting ‘curious’ items. Nevertheless, the existence of a few objects with natural holes indicates their potential for suspension. However, the absence of research on possible wear marks means we cannot be certain whether or not these objects were indeed used as SOA.

The only unambiguously perforated mollusc (an example of L. obtusata) known from a presumably Middle Paleolithic site comes from level Vc at El Ruso I, Spain. A recent study of the lithic assemblage suggests that the material should instead be assigned to the early Aurignacian (Castañedo Tapia, 1997). Given that post-depositional erosion at this site may have mixed archaeological material from different periods (Muñoz Fernández and San Miguel Llamosas, 2001) the cultural affiliation of the perforated mollusc must remain in question. Similar contextual doubts concern a bear tooth grooved at the root collected by Courtier in the first part of the twentieth century from the Mousterian deposits of La Rochette, France (Taborin, 1990). The early age of the excavations and poor documentation, and the presence of overlaying Aurignacian layers at the site, raises the question whether this item should be assigned to the Aurignacian instead. The Middle Paleolithic context of a perforated lynx canine within level D1 at Cova Beneito (Iurbe Polo et al., 1993) is also in question (Villaverde Bonilla et al., 1998). In a recent review of the Middle–Upper Paleolithic sequence it was shown that the canine could also derive from the overlying Aurignacian layer B8 (Doménech Faus, 2004), which contains a single perforated object of this kind.

Suspended Objects of Adornment (SOA) at the Middle to Upper Paleolithic Transition in Europe?

A number of researchers have repeatedly claimed that the earliest evidence of SOA in Western Eurasia date at the Middle to Upper Paleolithic transition (e.g., d’Errico et al., 1998, 2003; Taborin, 1990, 2004). However, the number of SOA assigned to this period is limited (cf. Fig. 1), and their archaeological context is problematic (Álvarez Fernández, 2006, in press; Gioia, 1990; Hahn, 1977; Jöris et al., in press; White, 2001, 2002; Zilhão, 2007). In addition, few radiocarbon dates have been obtained for samples from levels containing such finds, and of those available many have large standard deviations and are of questionable validity (Jöris et al., 2003, in press).

In Western Europe, SOA have been reported from only a few Chatelperronian levels (d’Errico et al., 1998; Taborin, 1990, 1993; White, 1993), while in total more than 120 Chatelperronian inventories have been recorded in France and Cantabrian Spain (Demars, 1996) lacking any SOA. Among these the Grotte du Renne at Ayr-sur-Cure, France, is most central to the discussion of SOA and the context of the so called “transitional” industries. In the Chatelperronian layers
found within a Chatelperronian context at St. Cezende, 2006). According to White (2002), who restudied Leroi-Gourhan’s original documentation, the Chatelperronian and Aurignacian levels were stratigraphically mixed. White further argues that many SOA found at Arcy-sur-Cure were not recorded precisely with respect to their three dimensional spatial orientation (White, 2001, 2002; Álvarez Fernández, 2006; Jöris et al., in press; cf. Zilhão, 2007).

Whether two perforated teeth found during excavations by Poirier, Bailleau and Delporte in level B4 of the Grotte des Fees, France, may indeed belong to the Chatelperronian remains unclear, since the sequence (Layers B4–B1) also contains several tool types which are characteristic for the Aurignacian (Álvarez Fernández, 2006) as Delporte had already argued (cf. Delporte, 1999). Unfortunately, due to limited contextual information, the recently obtained radiocarbon samples from Layers B4–B1 (Gravina et al., 2005) have not silenced the debate (Zilhão et al., 2006; cf. Mellars et al., 2007). Other perforated pendants from French sites that date to this time period, such as those from Roche au Loup, Grotte du Trilobite, and Roc du Combe, are also associated with questionable archaeological contexts (Álvarez Fernández, 2006; Rigaud, 2001; cf. Bordes and Labrot, 1967; Sonnevile Bordes, 2002; Taborin, 1990, 1993).

In 1968, Lévêque identified four Chatelperronian layers at Quinçay, France, which he grouped into two sequences, a lower one containing an “Archaic Chatelperronian” and an “Early Chatelperronian” and an upper one with “Evolved Chatelperronian” and Chatelperronian “à caractères régressifs”. The site does not contain any Mousterian levels (Lévêque and Miskovski, 1983). Three fox canines, a wolf canine, and two atrophied red deer canines, all perforated, were recovered from the upper part of the sequence (Granger and Lévêque, 1997), but the lack of a detailed site report makes it impossible to evaluate the archaeological provenance of the SOA (Álvarez Fernández, 2006).

Several unpublished “dentalium beads” found within a Chatelperronian context at St. Cezende are claimed to be associated with a Neandertal burial (Zilhão and d’Errico, 1999; Zilhão, 2007). Two Turritella temprina fossil shells were reported from level 7 at Cauna de Belvis (Sacchi, 1986; Taborin, 1993), but it remains unclear whether any of these specimens were artificially modified (cf. Zilhão, 2007).

Out of approximately thirty sites attributed to the Uluzzian, SOA have only been found at Grotta del Cavallo in Italy (Palma di Cesnola, 2004) and in the ‘Uluzzian-like’ assemblage of level V of Klisoura Cave I in Greece (Koumouzelis et al., 2001). Grotta del Cavallo was dug by Palma di Cesnola, who identified several Middle Paleolithic layers (MIV–FI) below a layer with volcanic ash (Fa), which was overlain by a series of Uluzzian layers: Archaic Uluzzian (layer E-III: levels E7–E5), Evolved Uluzzian (layer E-II-I: levels E4–E2 and layer E-D: level E-1) and late to final Uluzzian (layer D-II: levels D4 and D3 and layer D1b: levels D2 and D1), with the uppermost Uluzzian levels displaying “Aurignacian elements”. Romanellian layers (levels BII–BI) were superimposed above the Uluzzian. Recent scaphopods were found in the Archaic Uluzzian (E-III) and perforated specimens of the marine gastropods (Cycloper neritea and Columbella rustic) were found in the Evolved (level E1) and Late Uluzzian (layers DII and D1b) (Palma di Cesnola, 1966, 1989, 2001). Goia, who studied the Uluzzian lithic assemblage at the site, describes carinated and snout-shaped scrapers, blades with Aurignacian retouch, and backed bladelets from layer D, and suggests that an Aurignacian layer may have existed but has not been identified in the course of excavation. Layer D was disturbed by animal burrows and by trenches and structures of the more recent Romanellian layers (Goia, 1990). Therefore, it is possible that the examples of C. neritea and C. rustica, presumed to originate from the Evolved and Late Uluzzian levels, may actually derive from Aurignacian or Romanellian layers (Álvarez Fernández, 2006). Regarding some scaphopods (Dentalium entalis) from the Archaic Uluzzian of Grotta del Cavallo (Level E-III), no indication is given whether they were actually modified by humans; they may have been simply collected as curiosities, without being used as SOA (Álvarez Fernández, 2006). Similarly, it is unclear whether the
mollusc shells (one of them of *Pecten* sp.) in Level 4 of Castelcivita, Italy (Gambassini, 1997), and “Dentalium beads” found in Level V at Klisoura Cave (Koumouzelis et al., 2001) were modified and used as SOA. However, at Grotta delle Caballo, Castelcivita, and Klisoura, Ulluzian or Uluzzian-like levels are overlain by layers ascribed to the Aurignacian, where remains of marine molluscs have also been documented, some of which were transformed into SOA.

In Central Europe, transitional industries, grouped together under the term “Blattspitzenindustrien” or “Blattspitzengruppen”, are characterized by leaf-shaped semi or fully bifacially worked tools. These industries include the Szeletian, the Jerzmanowician, the Bohunician and the Altmühlgruppe (Bosinski, 2000–2001; Hahn, 1993; Jöris, 2004).

The only Central European Blattspitzen assemblage that produced SOA is Level X at Ranis 2, Germany. This level yielded a punch and a disc, both of ivory, although the latter broke and dissolved during excavation (Hüll, 1977: 29; Bosinski, 2000–2001: 128). While Hahn claims that Level X represents a deposit mixed with material from the overlying Aurignacian (Hahn, 1977: 103), the later monograph by Hüll (1977) argues that the disc may indeed be attributed to the leaf point assemblage. Recently published 14C AMS dates for Ranis (Grünberg, 2006) do not clarify the absolute age of the stratigraphic sequence (Jöris et al., in press).

A fish-tail ivory pendant associated with leaf points and a laminar lithic technology (Ketraru, 1973: Fig. 29; Kozlowski, 1992: Fig. 31) has been found in Level 3 of Brynzeny I in Moldavia, and ascribed to the Szeletian. Its decorated pattern of dots is characteristic of the Aurignacian, which led Bosinski (1982, 1990) to place the object in a EUP context.

The Bachokirian is the term applied to a series of archaeological occurrences located in caves such as Temnata Dupka and at the eponymous cave site of Bacho Kiro, both located in Bulgaria. According to Hahn (1993: 67) this term is not sufficient to define a “technocomplex“, although recent work defines the “transitional” character of the Bachokirian in greater detail, and suggests an origin in the (not necessary regional) Levallois Mousterian, combined with a laminar lithic scheme of production that resembles Upper Paleolithic technology (Teyssandier, 2007).

The site of Bacho Kiro was excavated by Kozlowski between 1971 and 1975. The basal part of the sequence (levels 11 and 9) was attributed to the “Bachokirian“ or “Pre-Aurignacian“, and is overlain by Aurignacian and younger levels (Kozlowski et al., 1982; cf. Kozlowski, 1992; Rigaud, 2001). Level 11 yielded two fragmented perforated teeth belonging to bear and fox, while Level 9 yielded a perforated rib fragment with oval cross-section that was cut at its distal end (Kozlowski et al., 1982: 141; cf. Ginter and Kozlowski, 1982: 170). The first radiocarbon sample obtained from Level 11 dated to > 43,000 14C BP (GrN-7545). Later radiocarbon samples from the same level failed to clarify the chronology, producing results between 33,750 ± 850 14C BP (OxA-3184) and 38,500 ± 1700 14C BP (OxA-3213) (Hedges et al., 1994; Table 1).

Finally, Zilhão (2007) argues that a perforated fossil gastropod found during Felgenhauer’s excavations (1956–1959) in Level 2 at Willendorf II (Lower Austria) should be ascribed to the Middle to Upper Paleolithic transition. However, this level provided only a very small lithic assemblage (n = 32) lacking “typical Aurignacian or transitional forms” (Teyssandier et al., 2006). Perhaps the gastropod shell is identical to the perforated “marine snail” mentioned by Papp (1956–1959) in his study of the molluscs recovered from Levels 1 to 4 at Willendorf II (*Viviparus* sp. with a dubious perforation and questionable identification). The same researcher also records the presence of local fossils in these levels (*Dentalium badense* PRATSCH and *Dentalium bouei* DES-HAYES).

EARLY UPPER PALEOLITHIC SUSPENDED OBJECTS OF ADORNMENT (SOA)

From the outset of the Upper Paleolithic, a large number of SOA, made on a wide variety of raw materials have been recorded (Álvarez Fernández, 2006; cf. Vanhaeren and d’Errico, 2006).

In addition to the examples from Level 11 at Bacho Kiro, the earliest unambiguous evidence of SOA in Europe has been documented in Proto-
aurignacian contexts (Fig. 1). The Protoaurignacian is technologically and typologically distinct from the preceding European technocomplexes; it is defined by a lithic technology geared toward the production of blades and bladelets within a single chaîne opératoire, where the fossil-director is dufour blades. It is dated to ca 38.3–34.2 ka $^{14}$C BP (Table 1) and likely the product of Anatomically Modern Humans (Jöris et al., in press; cf. Maíllo Fernández, 2002). Some of the assemblages ascribed to the Protoaurignacian (Table 1) have yielded abundant SOA, manufactured from marine shell of different species (the most frequent are Homalopoma sanguineum, Littorina obtusata, Nassarius mutabilis, Nassarius gibosulus, Nassarius reticulatus, Cyclope sp.), and mammal teeth. The latter category includes grooved red deer incisors from Fumane, a perforated carnivore tooth and beads of soft stone from Mocchi, perforated herbivore incisors and a bead of amber from Isturitz, a pierced red deer canine and steatite bead from Rothschild, and an atrophied red deer canine and some fish vertebrae from Romani (Álvarez Fernández, 2006; Vanhaeren and d’Errico, 2006; Zilhão, 2007).

The number of SOA in Aurignacian contexts is much greater than in the Protoaurignacian. In addition (Fig. 2), the Aurignacian provides the earliest undeniable evidence for complex figurative art and the emergence of standardized bone, antler and ivory weapon technology. The oldest radiocarbon dates available for this period date to about 35.0 ka $^{14}$C BP (Jöris et al. in press), i.e. about 3,000 radiocarbon years younger than the oldest dates for the Protoaurignacian, to be estimated to ca 38.3 ka $^{14}$C BP (weighted mean of six measurements from level H[B1] of L’Abreda; cf. Table 1).

During the Aurignacian, various non-fossil marine mollusc shells of Atlantic and Mediterranean origin, including gastropods, bivalves and scaphopods, were modified and used for SOA (Álvarez Fernández, 2006; cf. Vanhaeren and d’Errico, 2006). These were shells without any nutritional value, collected at beaches (since they are eroded by wave action (Taborin, 1993; Stiner, 1999; Álvarez Fernández, 2006) for shape (glo- bular as the Naticidae family, tubular as Antalis sp.) and color (red as H. sanguineum, yellow as Turritella sp.).

Fig. 1. European “transitional” industries. Black – sites with Suspended Objects of Adornment (SOA) discussed in text; Grey and italics – sites with dubious evidence of SOA. Map based on SRTM data (space radar topography measurements); sea level lowered by 75 m
Table 1
Earliest evidence of Suspended Objects of Adornment (SOA) in Western Eurasia

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* association of SOA with Protoaurignacian or Mid Upper Paleolithic assemblage unclear; wm – weighted mean
Few examples of gastropod species of exclusively Mediterranean origin (mainly *H. sanguineum*, *Cyclope* sp., *C. rustica*) have been found at various sites in Europe. So far, no examples of these have been found in Cantabrian Spain. In the Pyrenees, these Mediterranean species are practically absent, whereas they are more abundant in the French Midi. For example, in the Dordogne such shells were found at Castanet and Blanchard I, both of which are located 250 km from the Mediterranean coast. Along the Mediterranean coast of Spain, the Italian Peninsula and Greece, gastropods of exclusively Mediterranean origin predominate (e.g., Beneito and Foradada in Mediterranean Spain; Bombrini and Cala in Italy; and Klisoura in Greece). The sites located near the Atlantic coast contain exclusively Atlantic species, particularly *L. obtusata* (e.g., El Ruso I in Cantabria, and Istaritz in southwest France).

Gastropods that currently live in the Atlantic are known from French sites (Perigord, Charente and Gironde) that in some cases are located more than 300 km from the Atlantic coast (e.g., Souquette, La Combe). In the case of *L. obtusata*, SOA of this species are only present at sites in the Center-West of France (e.g., Blanchard I, Castanet) and the French Pyrenees (e.g., Tuto de Camalhot).

Non-fossil bivalves and scaphopods were rarely used as SOA during the Aurignacian. One of the most commonly used bivalves is *Glycymeris* sp. (e.g., at Beneito in Mediterranean Spain; and Istaritz in the Western Pyrenees). Non-fossil scaphopod species are found further to the south (e.g., Blanchard I and Castanet, and Klisoura).

With regards to fresh water gastropods, the genus *Teodoxus* has been found in EUP levels at sites in Mediterranean Spain, such as Cova Foradada and Beneito. Similarly, perforated examples of *Teodoxus* sp. have been recovered at Klisoura, Siuren I, and in the EUP of Kostenki 14. They are probably specimens collected from nearby rivers.

SOA were also manufactured from different kinds of teeth from a variety of mammals, mainly artiodactyls, and to a lesser degree carnivores and perissodactyls. Human (e.g., La Combe) and rodent teeth were used more rarely as SOA. Certain kinds of teeth were selected, depending on the animal species, with a preference for canines and incisors of red deer, horse, carnivores, and other species. In France, the teeth used most frequently for SOA were the canines of large or medium

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**Fig. 2.** Aurignacian sites in Europe. Black – sites with Suspended Objects of Adornment (SOA). Map based on SRTM data (space radar topography measurements); sea level lowered by 75 m
sized predators, mainly fox (e.g., La Souquette) but also wolf (e.g., Istoritz) and cave lion (e.g., Fourneau du Diable). Deer atrophied canines are also known (e.g., La Combe), while the incisors of other species, such as of reindeer (e.g., La Ferrassie), ibex (e.g., Gatzarria), horse (e.g., La Quina) and red deer (e.g., Gatzarria) were utilized far less frequently.

The teeth most frequently used as SOA during the Aurignacian in Central Europe were fox canines (e.g., Trou Renard, Breitenbach, Willendorf II), however teeth of large predators were also used (e.g., hyena incisors at Hohle Fels, bear canines at Tischofer-Hohle): it is more unusual to find deer atrophied canines (e.g., Hohle Fels), horse (e.g., Willendorf II) or ibex incisors (e.g., Hohle Fels). Such objects are rarer further to the east (e.g., deer atrophied canines at Romualdova Pečina, fox canines at Mamutowa, bear canines at Cioclovina, horse incisors at Mrádeč, beaver and reindeer incisors at Mrádeč, wolf incisors at Brodu Mare in Ohaba Poron, badger incisors at Sandalja II). In Cantabrian Spain, deer atrophied canines are most frequently encountered (e.g., El Pendo). In Mediterranean Spain, it is important to note the use of lynx canines, for example at Foradada. Red deer atrophied canines are also present at Romani. In the rest of Mediterranean Europe, perforated teeth of the same species have been recorded at Klisoura.

Bone fragments with perforations, presumably used for suspension have been recorded at Mrádeč (a mammal rib) and Abri Pataud (reindeer epiphysis). Beads, especially those made from bird diaphysis (e.g., La Garma A, Kostenki 14), and fish vertebrae (e.g., Romani, Gatzarria) have also been discovered. Finally, bone fragments manipulated to imitate red deer atrophied canines have been found at sites such as Les Rois and Blanchard I.

Antler was modified more frequently than bone, especially at sites in western France and the Pyrenees, to produce, for example, “basker-type” beads (e.g., Gatzarria). Perforated objects made from this material have also been recorded in Central Europe (e.g., retouchers at Geissenklösterle), and assegais were re-used as SOA (e.g., La Souquette). Imitations of deer atrophied canines were also made of antler at Gatzarria.

However, during the Aurignacian, mammoth ivory was the material most frequently used for SOA production. Above all, ivory was used to make beads of different types and size, or perforated plaques (e.g., Trou Magrite), sculptures of animals (e.g., Vogelherd, Hohle Fels) and other pendants. Nonetheless, the most characteristic SOA of ivory during the Aurignacian are basket-shaped ivory beads (perles à panier); such beads were also occasionally produced out of other materials such as soft stone, antler or bone. This type of bead is small in size, between 5 and 10 mm, although examples as large as 15 mm; it is found in Belgium (e.g., Spy), the German Lower Rhineland (e.g., Lommersum) and along the Upper Danube (e.g., Geissenklösterle). In addition, imitations of animal teeth made of ivory, such as deer atrophied canines, have been found at Gatzarria, and imitations of molluscs belonging to the Nassaridae family have been found at La Souquette and Tuto de Camalhot, and to the Cerithiidae family have been found at Spy.

During the Aurignacian, a wide variety of minerals were employed in the production of SOA. Basket-shaped beads, for example, were made of soft stone (gypsum or limestone), for example at Gatzarria. Similar objects, but of different morphology and made of volcanic rocks, have been found at Spy. Comparable finds come from Isturitz and Wildscheuer. Beads were also made of ochre (e.g., Istoritz), clayey schist and nephrite (e.g., Wildscheuer), jet (e.g., Geissenklösterle), and sandstone (e.g., Vogelherd). Another organogenic raw material, amber, was used during the Aurignacian perhaps also in the production of SOA (Álvarez Fernández et al., 2005).

With the onset of the Upper Paleolithic there is continuous and ample evidence for the use of marine fossils as SOA (e.g., different species of gastropods, bivalves, scaphopods, belemnites, ammonites, sea urchins). Such finds are documented at French sites (in the Dordogne, Pyrenees and Midi), but are particularly abundant at sites in the interior of the European continent. At some sites (e.g., Blanchard I), non-fossil shells from the Atlantic and from the Mediterranean and fossil beads have been recorded. Fossil scaphopods are only found in Aurignacian contexts in Central Europe (e.g., Willendorf II, Langmannsdorf, Potočka Zijalka, Istállóskö). Perforated fossils have also been recorded. Ammonites are de-
scribed for the Aurignacian at La Souquette, bel-
ennites at Blanchard I, sea urchins at the latter
site and at La Ferrassie and shark teeth at La
Piage.

It is difficult to determine from which geolog-
ical deposits the different fossil species came.
These fossils may have been gathered from the
Tertiary beds of the Paris, Mainz, Vienna, Horn
and Steinheim basins (Taborin, 1993; Álvarez
Fernández, 2006).

Beginning with the Upper Paleolithic, ochre
also appears to have been used side by side
with SOA; in some cases SOA were stained with ochre
either intentionally or indirectly through contact
with clothing.

SOA were in continuous use from the Aurig-
nacian to the later European Upper Paleolithic
and Mesolithic, and the raw materials, manufac-
turing techniques, decorations, and use of ochre
remained consistent.

DISCUSSION AND CONCLUSION

Considering only the solid, unambiguous stra-
tigraphical association, we argue that Anatomically
Modern Humans were the only hominins to
manufacture SOA. Early Homo sapiens were
likely the producers of SOA at sites in Africa
(e.g., Tofaralt, Blombos, Enkapune Ya Muto), the
Near East (e.g., Skuhl, Üçağızli and Ksar ‘Akil),
at Kostenki 14, and at sites in Central Asia (e.g.,
Dörölj 1 and Kara Bon). They are also responsible
for the first SOA identified in Europe which are
attributed to the Protoaurignacian and Aurigna-
cian technocomplexes.

A critical analysis of SOA found in archaeo-
logical contexts ascribed to the Middle to Upper
Paleolithic transition (e.g., Chatelperronian, Blattspitzengruppen, Uluzzian and Bachokirian) indicates that the earliest SOA are only associated
with the Protoaurignacian and Aurignacian (Fig.
1); no unambiguous evidence for the intentional
perforation of objects is found for the entire Euro-
pean pre-Upper Paleolithic record. Likewise no
debris associated with SOA production or SOA
broken during manufacture have been identified
in Middle Paleolithic or older contexts.

Concerning the “transitional” sites (e.g.,
Grotte du Renne at Arcy-sur-Cure, Grotte des
Fées, Roc de Combe, Grotta del Cavallo and Ra-
nis 2) several researchers have suggested that
some of these transitional contexts likely result
from admixture with Aurignacian or later material
(Álvarez Fernández, 2006, in press; Gioia, 1990;
Hahn, 1977; Jöris et al., in press; White, 2001,
2002; Zilhão, 2007). Such taphonomic problems
may also apply to material from Roche au Loup
and Trilobite Cave, however these sites were ex-
cavated in the early twentieth century and so this
issue cannot be tested.

To summarize, at approximately 200 as-
semblages ascribed to the Middle to Upper Paleo-
lithic transition, SOA have only been found at St.
Césaire, Klisoura I, and Quinçay. At Quinçay six
perforated animal teeth were found in the upper
part of the Chatelperronian sequence (evolved
Chatelperronian and Chatelperronian “à caractè-
tères regressifs”). In the case of the “Dentalium
shells” from the Saint Césaire burial and Klisoura
I, it is not clear whether any of these shells were
artificially modified, or if they were used. They
may simply have been collected as curiosities.
The absence of a site monograph of Saint Césaire
makes a critical assessment of the context of these
finds impossible.

Layers 11 and 9 at Bacho Kiro produced few
SOA and have not been studied in detail. How-
ever, the presence of overlying Aurignacian lev-
els with SOA suggests that younger material may
have contaminated the transitional assemblages.

Based on these results, we argue that the ear-
liest evidence of SOA in Europe is related to the
spread of Anatomically Modern Humans into this
territory, and may be ascribed to the Bachokirian
and Protoaurignacian. The earliest radiocarbon
dated sites with SOA range from ca 38.3–34.2 ka
14C BP (Table 1; ca 42–40 ka cal BPHulu, Weniger
et al., 2007), with the greatest frequency of mate-
rial dated from ca 36.0 ka 14C BP onwards (Jöris
et al., in press).

From the start of the EUP we find that SOA
were made from a wide range of materials
(mainly shell and teeth of different species, but
also bone, antler, ivory, and a variety of minerals).
At the same time we can observe the use of differ-
ent techniques to perforate and shape objects,
with a great variety of decorations that continue to
be used throughout the subsequent phases of the
Upper Paleolithic and Mesolithic. In addition,
some of these SOA, specifically various species
of marine shell, prove the existence of large social networks distributed over several hundred kilometers. We believe such networks reflect social capabilities (probably neurologically predetermined) unique to *Homo sapiens sapiens* and that the lack of such behaviors among the Neandertals contributed significantly to their extinction.

Acknowledgements

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