BEGINNINGS OF ART: 100,000 – 28,000 BP

A NEURAL APPROACH

Volume 2 of 2

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Submitted for the qualification of PhD

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September 2009

VOLUME TWO

MAPS

CATALOGUE

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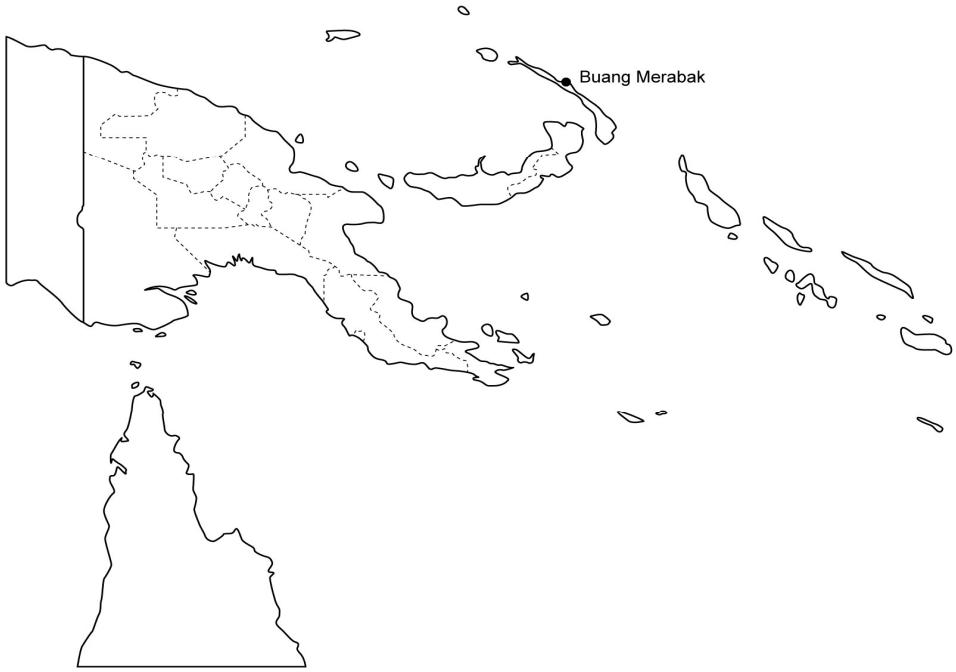

Map 3. Papua New Guinea

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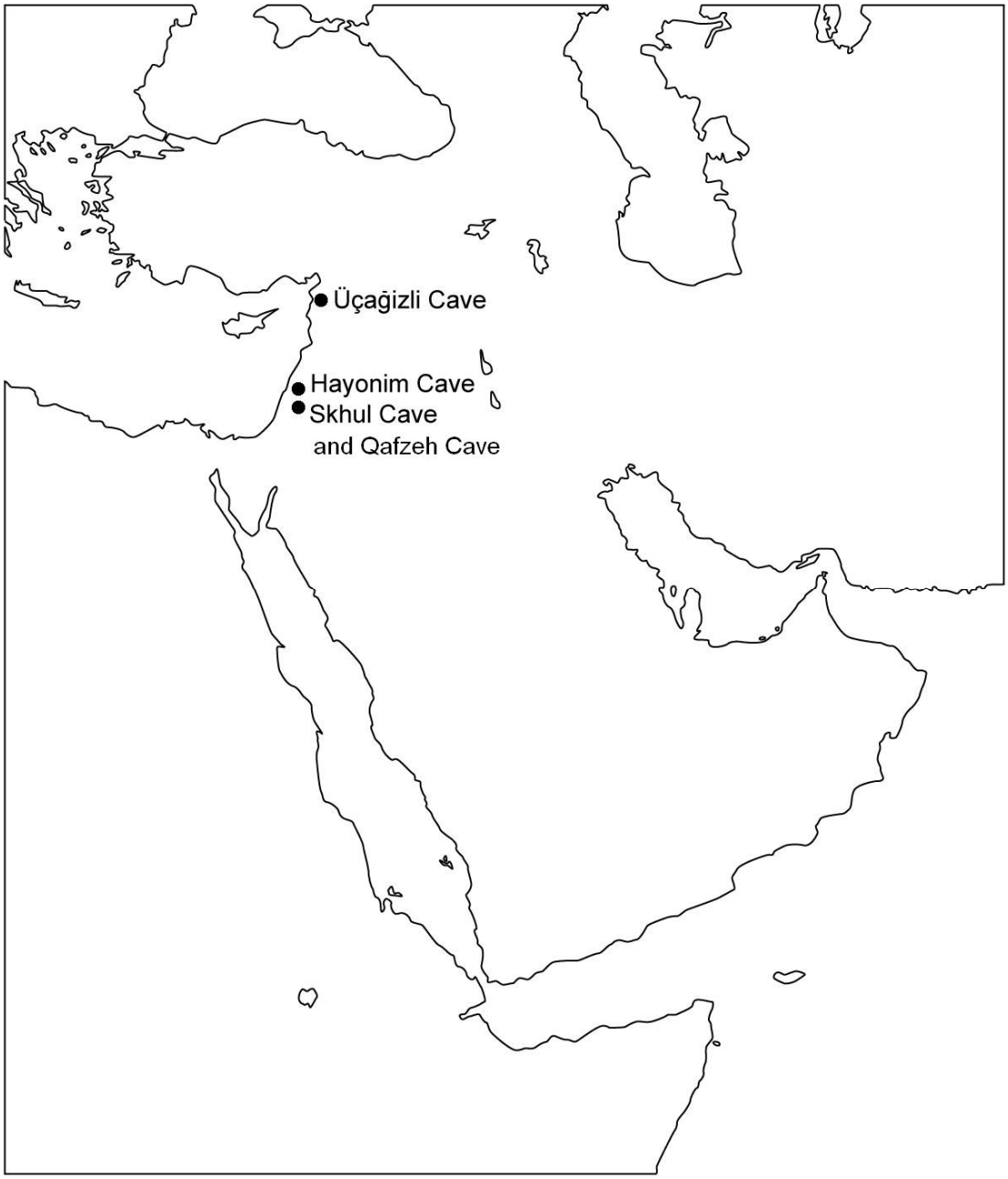

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Catalogue No.	**1**
Site Name	Skhul Cave
Location of Site	Slopes of Mount Carmel, 3 km south of Haifa, Israel.
Date of Artefact	100,000 BP
Object Type	Two perforated *Nassarius gibbosulus* shells
Dimensions	The length of the Skhul specimens is significantly larger than that recorded on reference collections, including one from the shore close to the site. This does not necessarily imply a preference for large shells, as the variability of size for *N. gibbosulus* shells through time is unknown.
Description of object	Specimens show a single perforation located in the centre of the dorsal side.
Material	*Nassarius gibbosulus*
Type of site	Cave site
Environmental conditions	Mount Carmel is 3.5 km from the Mediterranean shore, located in a coastal mountain range in northern Israel stretching from the Mediterranean Sea towards the southeast. The mountain formation is an admixture of limestone and flint, containing many caves, and covered in several volcanic rocks. The sloped side of the mountain is covered with luxuriant vegetation, including oak, pine, olive, and laurel trees. The altitude of Skhul was between 45m to 150m above sea level, between 100,000 and 135,000 years ago.
Context	Reference: L15138. Context determined through sediment matrix adherent to one of the two perforated *N. gibbosulus* shells.
Description of context	The stratigraphic positions of the two *Nassarius* shells were not explicitly recorded in the original excavations, but Vanhaeren *et al.* (2006) argue that the two perforated *N. gibbosula* are from layer B.
Associated finds	The lithics from Skhul Layer B were attributed to the Levantine Mousterian and have been compared with Tabun and Qafzeh, cave sites also located on Mount Carmel. Ten individuals, some apparently intentionally buried, were also recovered from layer B, confirmed as anatomically modern humans.
Date range of site	100,000-135,000 BP

Dating method	The sediment matrix adhered to one *N. gibbosulus* shell from Skhul was compared with sediment samples taken from layers B1 and B2, kept at the Natural History Museum in London. The chemical composition of the sediment adherent to the shell fits well with samples from B1 and B2. The thicker parietal shield on the specimen is consistent with it coming from the last Interglacial, showing a different width from modern specimens, and supporting its attribution to Marine Isotope Stage 5. Dating methods used were Electron Spin Resonance (ESR), Uranium series, and Thermoluminescence (TL).
Source of Raw Material	During the accumulation of layers B1 and B2 (100,000 to 135,000 years ago) the distance of Skhul from the sea varied between 3 km - 20 km. The good state of preservation, the small number and particular species range excludes storms as transporting agents. No known animal predators transport these shells into caves or far inland. They have been interpreted as non-food items as 100 specimens only provides 4.84g of dry soft tissue and require 30 minutes to extract.
Mode of production	Perforations similar in size and shape to those on the archaeological specimens were produced by indirect percussion, using a flint point as a punch and regularising the resulting hole by rotation. However, considering that natural agents can perforate the shell in the same way, the hole morphology alone is not evidence for human agency.
Microanalysis	Microscopic analysis indicates that the agent responsible for the perforations punched the shell body whorl from the outer dorsal side.
Interpretations	The state of preservation of the Skhul and Oued Djebbana shells is such that a definite conclusion cannot be reached as to the human origin of the wear. The argument made for evidence of their symbolic use is based on the remoteness from the sea, their low nutritional value, and the presence of unusual perforations. These beads are used as evidence to support the hypothesis that a long-lasting and widespread beadworking tradition existed in Africa and the Levant well before the arrival of anatomically modern humans in Europe.
Current location	Department of Palaeontology, Natural History Museum, London
References	Garrod & Bate,1937; Ramsey & Cooper, 2002; Vanhaeren *et al.* 2006

Cat. 1 Two perforated *Nassarius gibbosulus* shells, Skhul Cave

Image: Marian Vanhaeren & Francesco d'Errico / CNRS 2007http://www2.cnrs.fr/en/917.htm

Catalogue No.	**2**
Site Name	Qafzeh Cave
Location of Site	Situated near Nazareth in the Lower Galilee, Israel
Date of Artefact	92,000 BP
Object Type	Ten *Glycymeris* bivalves were discovered, some of them bearing ochre stains.
Dimensions	4-7 cm
Description of object	Some of the shells are stained with red, yellow, and black pigments of ochre and manganese. Each shell was perforated, with the perforations either natural or enlarged by percussion or completely created by percussion.
Material	*Glycymeris* bivalves
Formal analysis	*Shells from level XXIV* Square C12, No. 112, (Image1). This is a relatively robust/heavy valve of *Glycymeris insubrica*, (the largest in this assemblage) with a lip that was chipped and abraded in antiquity and a hole in the umbo (oldest part of a bivalve (clam, mussel, etc) shell near the ligament that holds together the two shell valves). On the inside (concave) surface there are remains of red ochre stains. On the outside surface is a very smooth patina in the centre of the valve and near the umbo. In the middle of this smooth area is a fairly deep groove that is rounded at its bottom. This groove seems to be the result of invertebrate activity, possibly a marine worm. Additional pitting is visible on the outside surface of this valve, and on the bottom right close to the lip are spots of yellowish ochre, as well as greenish spots. Square B14, No. 103, (Image 9). Three conjoining fragments of the lip (or margin) are very fragile and tend to fall apart to the touch. They are naturally abraded. Square B14, No. 102, (Image 7). This valve is broken along the “long” axis to the right of the umbo and along part of the lip. The surface is naturally worn and the umbo is naturally holed. A yellow ochre spot can be seen on the surface of the hole in the umbo. *Shells from level XXIII* Square C11, No.791, (Image 8). These two fragments were discovered together: one from the centre of the valve, 30 mm long, and another fragment 22 mm long from the shell margin.

Shells from levels XXII
Square C12, No.107, (Image 2). This *Glycymeris insubrica* valve is heavily beach worn with a hole in the umbo. The outside surface has pitting, as well as dark grey spots. Under magnification, reddish spots are also visible that could be ochre. The shell is overall smooth, the hinge has no teeth left, and the inner margin serration is completely missing. The hole of this valve is definitely a result of natural abrasion, but one corner is "notched", a result of use wear.

Shells from layer XXI
Square C10, No. 404, (Image 5). This is an almost complete valve, with slight breakage at the margin and a fairly large hole in the umbo. The shell is brown/violet. The hole seems to be a result of percussion as its walls are straight; it is impossible to determine whether this percussion was intentionally made by humans. In contrast, the breakage of the margin is typically rounded. A notch in the hole is rounded as a result of stringing.
Square C11, No. 632, (Image 6). Most of this shell has a reddish/ brown patina. There is a hole in the umbo and slight breakage of the lip in two places. On one side of the hinge that is broken, growth lines are clearly visible. The hole is a result of natural abrasion. The reddish patina seems to cover over the hinge teeth after they were heavily abraded. On one side of the hinge where there is no patina, the structure of the shell is visible, and in that area there are black spots of dendritic manganese.
Square C11, (Image 10). This is a *Glycymeris* fragment that contains a part of the hinge.
Square C13, No. 119, (Image 4). The shell has a beige patina and is slightly damaged and cracked on the outside surface. This wear seems to have existed in antiquity. The right side was broken post-excavation and has been glued, leaving some holes. The hole in the umbo is a result of natural abrasion, and it was further enlarged by percussion, either intentionally or during or after excavation, but the margins of the hole are not abraded or smooth.
Square B15, No. 73, (Image 3). This is a complete valve with a hole in the umbo. There are dark gray/ black spots of dendritic manganese both inside and outside. The hole is a result of percussion (either intentional or the result of natural movement against a rock), and on one side there is a smoother notch that is evidence of friction from a string.

Type of site

Cave site
Limestone cave twenty meters wide and twelve meters deep.

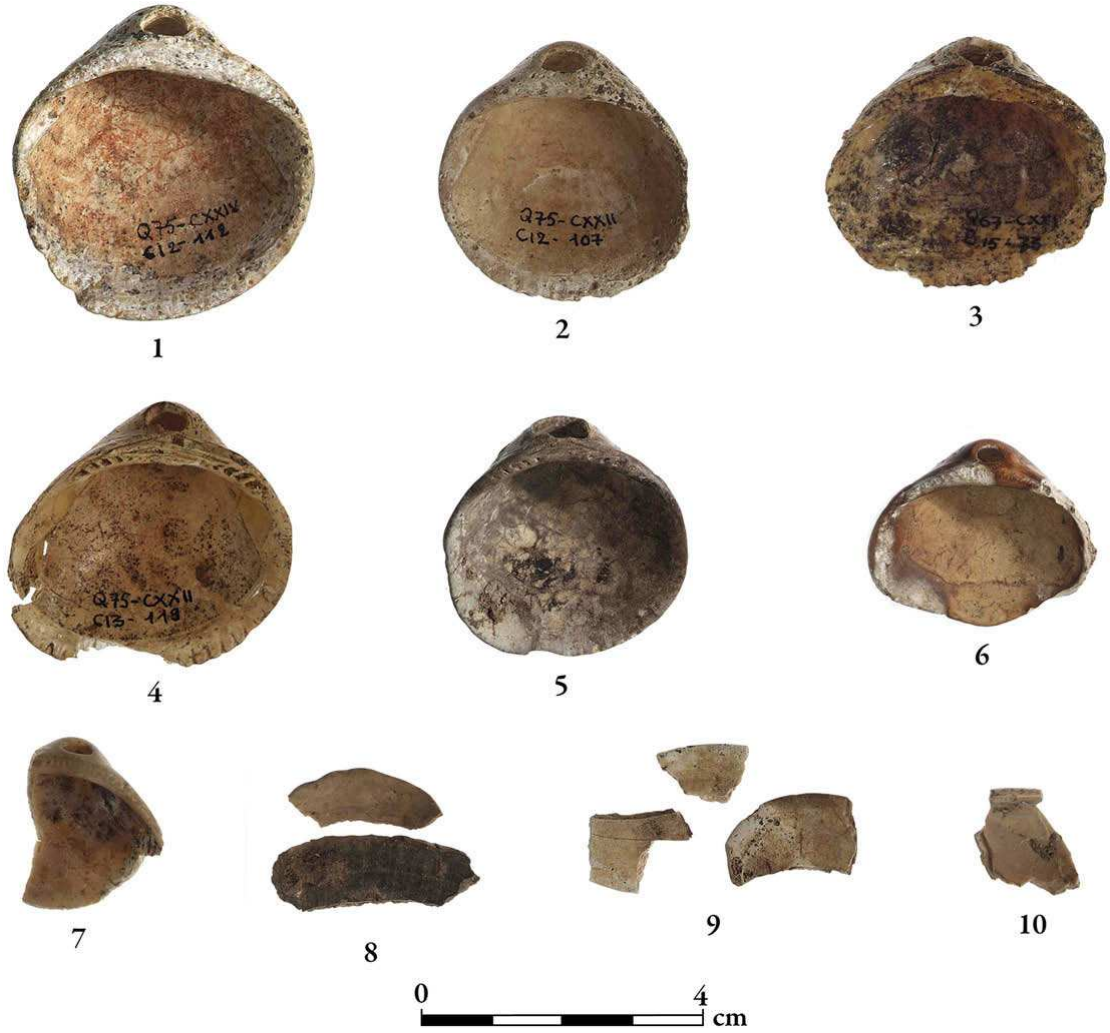
Environmental conditions	Animals represented in the Mousterian levels are red deer, fallow deer, and aurochs, and microvertebrates. The Upper Paleolithic levels include land snails and freshwater bivalves as food sources.
Context	The *Glycymeris* shells from Qafzeh bear a perforation on the umbo and were found in the layers that have yielded burials attributed to anatomically modern humans. The shells do not seem directly associated with the burials.
Description of context	The marine shells are not associated with burials, but rather appeared scattered more or less randomly throughout the deposit.
Associated finds	The site includes a series of hearths; stone tools are dominated by radial or centripetal Levallois technique artefacts. Human remains from Qafzeh cave include seven adults and at least nine juveniles. Qafzeh 9 and 10 are almost completely intact. All of the human remains appear to have been purposefully buried, if so, these are very early examples of modern behaviour indeed, direct-dated to 92,000 years BP. The largest numbers of ochre pieces at Qafzeh Cave were found in layers XIX and XXI. Indeed, the largest amounts of ochre came from the same levels as the shells
Date range of site	The oldest levels are dated to the Mousterian, ca 80,000-100,000 years ago
Dating method	TL dates of 92,000 +/- 5,000; ESR dates 82,400-109,000 +/- 10,000
Source of Raw Material	At the time of the Mousterian occupation of the cave, the sea coast was about 45-50 kilometers away; ochre deposits are known to be located between 6-80 km from the site. No other marine resources were found in the cave site deposits.
Mode of production	A recent taphonomic study of *Glycymeris insubrica* on the eastern Mediterranean coast (Sivan *et al*. 2006) demonstrated that shells with naturally perforated umbos are almost as abundant (41.5%) as non-perforated valves. Assuming that the *Glycymeris* population on the coast about 100,000 years ago was similar to that of today, it follows that the Qafzeh people targeted specifically shells with a hole in the umbo.
Microanalysis	The Qafzeh shells were examined under a binocular microscope at up to x45 magnification. Walter (2003) examined the red and black stains on two of the shells and determined that the red stains are ochre and the black are manganese. Indeed, black dendritic manganese stains are

a natural deposition and not a result of human activity, and were common throughout the site on the stone artefacts, as well as on the human skeletons. The red ochre stains, by contrast, are certainly the result of human manipulation, as demonstrated in a detailed study by Hovers et al. (2003).

Interpretations Modern behaviours indicated at the cave include the purposeful burials, the use of ochre for body painting and the presence of marine shells, used as ornamentation.

Current location

References Walter, 2003; Hovers *et al*. 2003; Sivan *et al.* 2006; Bar-Yosef Mayer, Vandermeersch and Bar-Yosef, 2009



Cat. 2 Ten *Glycymeris* bivalves , Qafzeh Cave

Image : Bar-Yosef Mayer *et al*. 2009

Catalogue No.	**3**
Site Name	Grotte des Pigeons
Location of Site	Near village of Taforalt, eastern Morocco. 34°48 38 N, 2° 24 30 W
Date of Artefact	82,000 BP
Object Type	13 perforated *Nassarius gibbosulus* shells
Dimensions	Max length = 1.741 cm Min width = 1.030 cm with variations between these
Description of object	13 deliberately perforated shells. Wear patterns on the shells imply that some of them were suspended, and covered in red ochre.
Material	*Nassarius gibbosulus* shells
Type of site	Cave site
Environmental conditions	The currently accessible cave, with a large entrance opening to the northeast, has a floor area within the drip line of 400 m². Today the site lies 40 km from the Mediterranean coast and at an altitude of 720m above sea level. The local vegetation cover is dominated by evergreen Cypress trees and Aleppo Pine, together with evergreen oak. In particular, group E is dominated by Atlas Cedar and deciduous Oak, with the latter declining at the expense of Cedar, suggesting an increasing ‘‘montane’’ (alpine) influence, perhaps reflecting environmental cooling and/or drying. Semiarid conditions are confirmed by the notable presence of *Gundi* (small, stocky rodents) which now occur well to the south of Taforalt in Mediterranean steppe and rocky outcrops along the northern margin of the Sahara. These taxa indicate that the shell occupation layer was closely associated with a largely open and sparsely vegetated environment with some locally wooded habitat.
Context	Within the Taforalt sequence, Middle Palaeolithic occupation horizons have been recorded in each of the groups C–F. All the shells have been found from the group E deposits and the majority from contiguous squares covering a maximum area of 6m².
Description of context	Seven shells were located in a set of lightly cemented, ashy lenses (c.12 cm thick) with evidence of human presence, including archaeological finds and hearth spreads. Two shells were from no more than 10 cm higher in overlying

	bed equivalents 18 and 19; which have a strong anthropogenic component and are relatively soft, thus the slight reworking of these objects is attributable to human activity. An additional four examples were found, in each case lying in the fill of burrows that intersect with Group E.
Associated finds	Group E is characterised by Middle Palaeolithic tools such as sidescrapers and small radial Levallois cores, and, in this group a few thin, bifacially worked foliate points also were recovered.
Date range of site	The layer containing the *Nassarius* shells dates to between 73,400 and 91,500 years ago.
Dating method	Four different dating techniques were used. Radiocarbon accelerator mass spectrometry determinations on eight pre-treated samples of charcoal provided a coherent set of dates for the upper part of the archaeological sequence. Optical dating of 15 sediment samples using the OSL signal of quartz and TL determinations on five burnt flint artefacts gave a series of consistent dates that provided age estimates for the shell-bearing deposits. Uranium-series isotopic measurements were made on two subsamples from the uppermost part of a layer underlying the archaeological layer with shells.
Source of Raw Material	The distance from the site to the contemporary coast could not have been <40 km. The shells were not intended for human consumption because all show features characteristic of dead shells accumulated on a shore.
Mode of production	Hole edges on the dorsal aspect are rounded and smoothed on four shells. The remainder have irregular outlines with chipping of the inner layer, indicating the agent responsible for the perforation punched the shells from the outer dorsal side. Holes with irregular edges may be obtained by punching the dorsal side with a lithic point. Smoothed hole edges have been replicated by wearing strung modern shells. Both types of hole edges occur on shells used as beads in Upper Palaeolithic sites. However, they are equally common on naturally perforated shells.
Microanalysis	Microscopic features diagnostic of human intervention in the production of the perforation are absent. Possible evidence for the stringing of the perforated shells as beads comes from the identification on ten specimens of a wear pattern different from that observed on both the modern reference collection and imperforated specimens from Taforalt. The wear in the latter case homogeneously affects the whole surface of the shells and consists of a

	microscopic dull smoothing associated with micropits and rare short, randomly oriented striations. The wear on the presumed strung examples is found on the perforation edge and on spots of the ventral and lateral side, and is characterised by an intense shine associated with numerous random or consistently oriented striations. Microscopic residues of red pigment were detected on one imperforated and nine perforated shells.
Interpretations	The most likely explanation for the presence of pigment on the shells is their rubbing against material embedded with ochre, such as hide, skin, thread, or other substance. The association with red pigment may have given them added visual value because these were the only items with colourant in the cave. This finding implies that material culture indicative of one aspect of behavioural modernity was present long before the Upper Palaeolithic of Eurasia. Bouzouggar *et al.* (2007) suggests that the Taforalt examples and evidence from other sites indicate that the choice, transport, colouring, and long-term wearing of these items were part of a deliberate, shared, and transmitted nonutilitarian behaviour. They argue that to be conveyed from one generation to another over a very wide geographic area, such behaviour must have implied powerful conventions that could not have survived if they were not intended to record some form of meaning.
Current location	National Institute of Archaeology and Cultural Heritage, Morocco
References	Roche, 1953; Bouzouggar *et al*. 2007

Cat. 3 Perforated *Nassarius gibbosulus* shells, Grottes des Pigeons

Image: Marian Vanhaeren & Francesco d'Errico / CNRS 2007http://www2.cnrs.fr/en/917.ht

Catalogue No.	**4**
Site Name	Oued Djebanna
Location of Site	Bir-el-Ater, Algeria
Date of Artefact	At least 75,000 years old
Object Type	One perforated *Nassarius gibbosulus* shell
Dimensions	Comparing the shell to modern representatives of this species, it is significantly bigger, which supports its attribution to the last interglacial.
Description of object	Specimen shows a single perforation located in the centre of the dorsal side.
Material	*Nassarius gibbosulus* shell
Type of site	Open air site
Environmental conditions	The faunal remains indicate a more humid savannah environment than at present. Oued Djebbana was never, during the whole Upper Pleistocene, closer than 190 km to the sea.
Context	Aterian Levels. The stratigraphic position of this single *Nassarius* shell is ambiguous because it comes from a 0.80- to 1.0 m thick archaeological layer in an open-air location that was excavated in the 1940s.
Description of context	The site contained a 36-m-long by 80- to 100-cm-thick archaeological layer under 3.9 m of sterile alluvial deposits. The central area of the site, rich in ashes, contained the perforated *N. gibbosulus* shell.
Associated finds	Associated finds consisted of a Middle Palaeolithic Levallois industry with Aterian points but also Upper Palaeolithic forms.
Date range of site	>35,000 BP. The dates obtained on other sites with similar stone tools (Aterian) suggest the site may be between 60,000 and 90,000 years old.
Dating method	For Oued Djebbana we only have an "infinite" radiocarbon date, which indicates the site is older than 35,000 BP.
Source of Raw Material	Oued Djebanna was never, during the whole of the Upper Pleistocene, closer than 190 km to the sea.

Mode of production	A single perforation located in the centre of the dorsal side
Microanalysis	None
Interpretations	The state of preservation of the Skhul and Oued Djebbana shells is such that a definite conclusion cannot be reached as to the human origin of the wear. The argument made for evidence of their symbolic use is based on the remoteness from the sea, their low nutritional value, and the presence of unusual perforations. These beads are used as evidence to support the hypothesis that a long-lasting and widespread beadworking tradition existed in Africa and the Levant well before the arrival of anatomically modern humans in Europe.
Current location	Department of Prehistory, Musée de l'Homme, Paris.
References	Morel, 1974; Vanhaeren *et al.* 2006

Cat. 4 One perforated *Nassarius gibbosulus* shell. Oued Djebanna

Image: Marian Vanhaeren. 2006. Archaeological Institute of America

Catalogue No.	**5**
Site Name	Blombos Cave (BBC)
Location of Site	Situated near Still Bay in the southern Cape, South Africa (34°25'S, 21°13'E)
Date of Artefact	77,000 BP
Object Type	41 perforated *Nassarius kraussianus* shells, commonly known as tick shells.
Dimensions	Ranging in length from 6.83 mm to 10.42 mm.
Description of object	Dark orange or black in colour most shells show evidence of traces of ochre. All the shells found in MSA context are adult, and within a group they display similar size, shade, use-wear pattern and type of perforation.
Material	*Nassarius kraussianus* shells
Type of site	Cave site
Environmental conditions	Recovered faunal remains indicate that subsistence strategies of the MSA people were wide ranging and included hunting large and small mammals, shellfishing, obtaining marine mammals perhaps by hunting and/or scavenging, and catching large fish and reptiles. Although sea levels may have dropped 25 m during the occupation of Blombos (coinciding with MIS 5a) the coastline remained less than 3 km from the cave. *N. kraussianus* shells occur only in estuaries, of which the Duiwenhoeks and Goukou rivers are located 20 km west and east of the cave respectively.
Context	39 shells from M1 phase = Top MSA phase 2 beads from M2 phase
Description of context	Find spots located towards rear of cave; 33 beads were found in six groups of two to twelve beads, each group being recovered in a single square or in two adjacent sub-squares.
Associated finds	M1 phase contains more than 400 Still Bay type bifacially worked lanceolate points, at least ten bone tools and one bone fragment bearing longitudinal engraved lines. Hundreds of pieces of ochre came from this layer of which at least two are deliberately engraved with an abstract crosshatched pattern.

Date range of site	140,000-70,000 BP
Dating method	Two quartz samples from the M1 phase yielded a combined OSL age of 75,600 ± 3400 BP. Thermoluminescence (TL) dates for five burnt lithic samples from the M1 phase have provided ages ranging between 67,000 ± 7,000 BP and 82,000 ± 8,000 BP with a mean of 77,000 ± 6,000 BP.
View/Perception of Object	Close perception involved in locating and choosing shells in estuary, as well as handling of object in order to perforate. Possibly viewed as personal ornamentation, traces of ochre may have added to its visual value.
Source of Raw Material	*N. kraussianus* is a scavenging gastropod adapted to estuarine environments. The closest estuaries today are those of the Duiwenhoks and Goukou Rivers, located 20 km west and east of Blombos respectively.
Mode of production	Experiments demonstrate that piercing the shell through its aperture with a bone awl or crab claw was the most effective way to perforate as it required little pressure, no re-sharpening of the tool, and did not break the lip. Small crabs live in the same habitat as *N. kraussianus* and bone awls were found in levels M2 and M1.
Microanalysis	Microscopic analysis of the shells reveals a distinct use-wear pattern, absent on LSA beads and natural shells, consisting of facets that flatten the outer lip or create a concave surface on the lip close to the anterior canal. The use-wear patterns recorded on the Blombos MSA shells are consistent with friction from rubbing against thread, skin, or other beads; one of the principal factors that define the MSA shells as beads. Four of the shells show microscopic traces of red ochre within the shell and on the outer surface. Deposition of the ochre may have occurred during the manufacturing process if the perforating tool was ochred, or possibly due to rubbing against ochred skin, thread or deliberate colouring of the beads.
Interpretations	Taphonomic, morphometric and microscopic analysis of modified *N. kraussianus* shells at Blombos provides clear evidence that the shells were deliberately perforated and worn as personal ornaments. Reconstruction of the method of perforation indicates the motions were careful and controlled. Evidence of heavily worn perforations and apertures indicates beads were worn for prolonged periods and probably in daily use. Henshilwood suggests a bead-making tradition was integral to the material culture of these people, and an unambiguous marker of symbolically

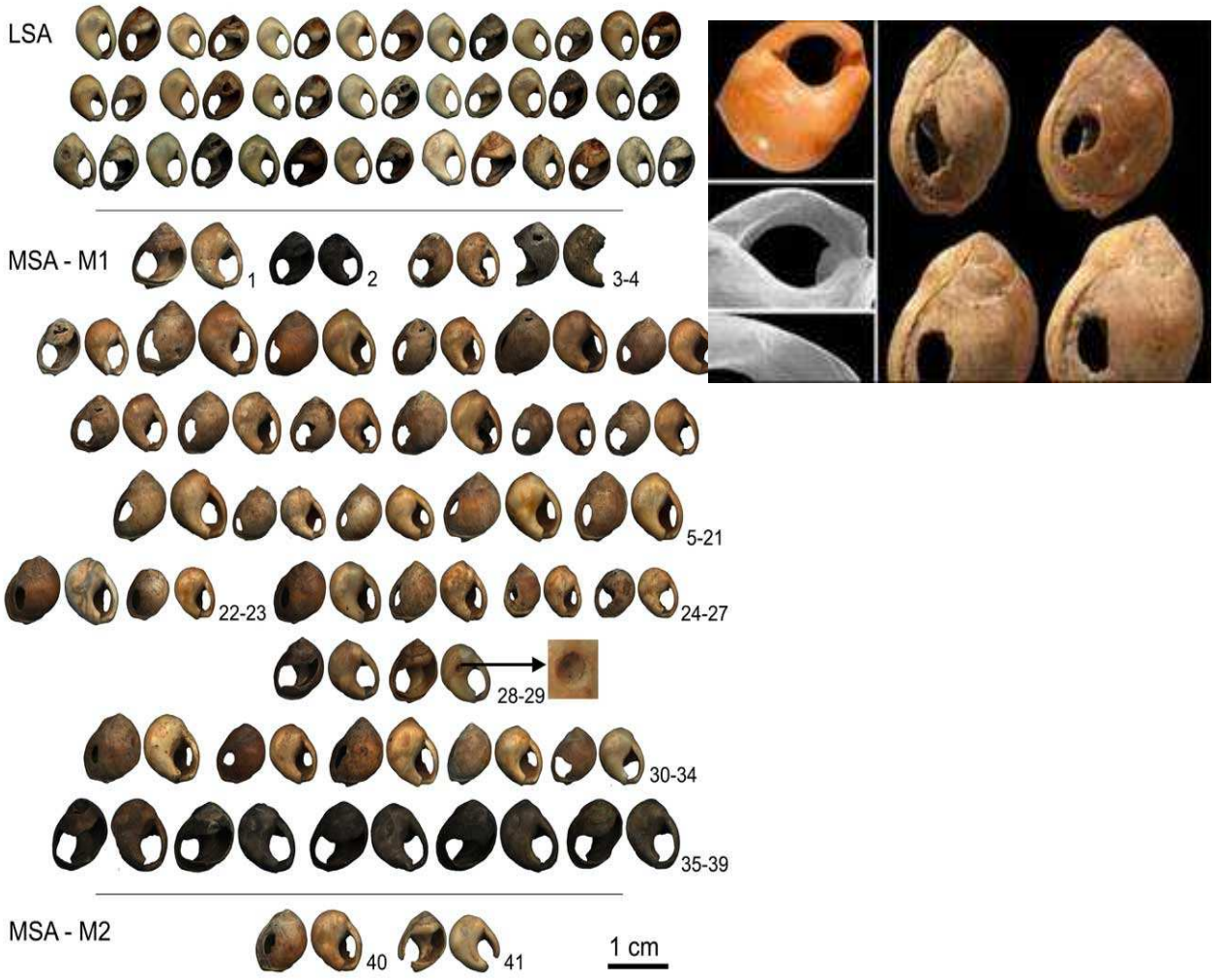
mediated behaviour. The symbolic meaning of these beads was necessarily shared and transmitted through syntactical language.

Current location

Iziko South African Museum
PO Box 61
Cape Town 8000
Catalogue Nos: SAMAA 8987-8990

References

Henshilwood *et al*. 2001, 2002, 2004; d'Errico *et a*l. 2005; Henshilwood, 2001, 2004, 2005, 2008



Cat. 5 Nassarius Kraussianus shells, Blombos Cave

Image: Chris Henshilwood: Blombos Cave Project website http://www.svf.uib.no/sfu/blombos/

Catalogue No.	**6**
Site Name	Wonderwerk Cave
Location of Site	Eastern flank of the Kuruman Hills, Northern Cape, South Africa. 27°50’46”S, 23°33’19”E
Date of Artefact	Found in levels pre-dating 100,000 BP
Object Type	Incised stone
Dimensions	2 cm long
Description of object	Initial description refers to shallow zigzag lines.
Material	Stone
Type of site	2,400 m² tunnel-like cave of Dolomitic limestone
Environmental conditions	The extreme aridity of the cave interior caused superb preservation of organic items, as shown by the 800,000-year-old horn fragments of an extinct antelope that still retain their keratin sheaths, and an area of humified grass bedding on which humans slept some 400,000 years ago.
Context	Recovered during the initial excavation of Stratum 2 in Exc. 3 during the early 1980s.
Description of context	Wonderwerk deposit was 6 m deep, made up of 9 stratum groupings or Major Units (MUs), which are numbered from the surface downwards (from the youngest level, MU1, to the deepest and oldest one, MU9). MU2: The second level down, contained traditional Middle Stone Age material, defined by the absence of handaxes and the presence of pointed tools (that is, ‘convergent points’). Uranium-series readings dated these artefacts at dates ranging between 70,000 and more than 220,000 years ago.
Associated finds	Associated behaviours are represented by the collection of exotic river pebbles and quartz crystals in MUs 2–4, incised lines on portable stones in MUs 1–4, a grass bedding area in MU4, red pigment pieces in MUs 1–7, and traces of the use of fire in MUs 1–9. During the initial excavation, the associated artefacts were tentatively referred to the LSA. However, the later greatly expanded lithic sample showed that the assemblage was typical pre-Howiesons Poort MSA at c.80,000 - 120 000 BP, with a basal maximum Uranium series age of 132,000 BP.

Date range of site	The lithic succession in the sediments was found to be Later Stone Age in MU1 at 1,000–12,500 BP, Middle Stone Age in MU2 at ~70,000 to >220,000 BP, Fauresmith in MUs 3–4 at ~270,000–c. 500,000 BP, and very sparse biface assemblages before then to >780,000 BP.
Dating method	Radiocarbon; Uranium-series; Luminescence and Electron Spin Resonance dating (ESR); Potassium-argon dating; Palaeomagnetic dating.
View/Perception of Object	Portable object - 3D view. The object is only 2 cm long and thus very portable. The size of the stone itself makes the practice of producing a pattern an intimate and detailed process.
Source of Raw Material	In MUs 2–4, in the front of the cave, were found single clusters of small rounded quartz and chalcedony pebbles, the nearest known source of which is the Kuruman River over 45 km away; the same units at the back of the cave yielded mainly quartz crystals, known to occur more than 20 km to the northeast.
Mode of production	Incised pattern. Analysis on production techniques has not been undertaken.
Microanalysis	None performed
Interpretations	Other incised stones from earlier deposits may suggest an engraving tradition extending back up to 500,000 years.
Current location	McGregor Museum, Kimberley, South Africa
References	Beaumont & Vogel, 2006; Jacobs *et al*. 2008; Beaumont 2008, pers.com

Cat. 6 Incised stone, Wonderwerk Cave

Image: Beaumont & Vogel, 2008

Catalogue No.	**7a**
Site Name	Blombos Cave (BBC)
Location of Site	Situated near Still Bay in the southern Cape, South Africa (34°25'S, 21°13'E), is c.100 m from the coast and 35 m above sea level.
Date of Artefact	77,000 BP
Object Type	Incised ochre
Dimensions	Weight = 39.2 g Maximum length = 5.36 cm Breadth = 4.26 cm Depth = 1.17 cm Streak colour notation 3060 Y65R
Description of object	Both the flat surfaces and one edge are modified by scraping and grinding. The edge has two ground facets, and the larger of these bears a cross-hatched engraved design. The cross hatching consists of two sets of six and eight lines partly intercepted by a longer line.
Material	Ochre
Formal analysis	Eight vertical lines oriented in the same direction, and five oriented in the opposite direction which haphazardly intersect the eight lines. The 'longer line' is horizontal and intersects only five of the eight vertical lines through the centre.
Type of site	Cave site in limestone cliff on coast.
Environmental conditions	The M1 phase (MIS 5a/4) occupation occurs during a period of falling sea levels (c. 60 – 70 m below present sea levels and 10-25 km from present coastline). *Donax serra*, a sand burrowing white mussel occurs in the M1 phase suggesting beach conditions in front of the cave. Densities of shell are lowest in this phase (17.5 kg per m3) probably because of the distance of the coast from the cave.
Context	M1 phase. Layer CC, square E6a
Description of context	Located adjacent to a small hearth, in a matrix of undisturbed and consolidated mixed ash and sand.
Associated finds	M1 phase lithics are typified by Still Bay type bifacial foliate points. More than 39 *Nassarius kraussianus* shells, another plaque of incised ochre, a few bone tools and an

	engraved bone came from this phase. A further seven engraved ochre pieces are under study.
Date range of site	140,000-70,000 BP
Dating method	Optically stimulated dating of the BBC hiatus aeolian dune by the multiple grain technique yielded a depositional age of 69,000 ± 5,000 BP and 70,000 ± 5,000 BP using synthetic aliquots. Thermoluminescence dates were obtained for five burnt lithic samples from the M1 phase. The mean age for the lithic samples is 77,000 ± 6,000 BP. An OSL age of 72,700 ± 3,100 BP was obtained for the M1 phase. Other dating methods, that have yielded similar ages for the Blombos MSA are electron spin resonance (ESR) and amino acid racemisation (AAR) Dates for the MSA levels using the uranium-series method are currently being processed by Prof. Stein-Erik Lauritzen at the University of Bergen, Norway.
View/Perception of Object	Portable object - 3D view
Source of Raw Material	The most likely source of the BBC ochre is the Bokkeveld Group, the nearest outcrops of which are approximately 15 km northeast in the Goukou valley and 17 km west along the coast. Unusually, more than 25 pieces have single or multiple holes that were drilled by mussels (bivalves) when the ochre source was covered by the ocean during a previous high sea level. Crustacean growth is also visible on some ochre specimens.
Mode of production	Incised/engraved - cannot find specific evidence of a particular tool at Blombos being used as engraving tool.
Microanalysis	Microanalysis shows that both the flat surfaces and one edge are modified by scraping and grinding, and the crosshatching pattern consists of two sets of six and eight lines partly intercepted by a longer line.
Interpretations	Deliberate abstract markings signify abstract thought and therefore modern human behaviour. They were made with symbolic intent and almost certainly had significance to the makers and the transmission and sharing of the meaning of the engravings relied on fully syntactical language.
Current location	Iziko South African Museum Cape Town Catalogue No: SAMAA 8937

Cat. 7a. Incised ochre SAMAA 8937, Blombos Cave

Image: Chris Henshilwood: Blombos Cave Project
http://www.svf.uib.no/sfu/blombos/

Catalogue No.	**7b**
Site Name	Blombos Cave (BBC)
Location of Site	Situated near Still Bay in the southern Cape, South Africa (34°25'S, 21°13'E), is c.100 m from the coast and 35 m above sea level.
Date of Artefact	77,000 BP
Object Type	Incised ochre
Dimensions	Weight = 116.6 g; Maximum length = 7.58 cm Breadth = 3.48 cm Depth = 2.47 cm Streak colour notation 4050 Y60R
Description of object	The engraving consists of a row of crosshatching, bounded top and bottom by parallel lines, and divided through the middle by a third parallel line that partitions the lozenge shapes into triangles.
Material	Ochre
Formal analysis	Some of the lines are well-defined single incisions; others have parallel tracks along part or all of their lengths. Much of the parallel tracking may have resulted from a change in position of the engraving tool causing simultaneous scoring from more than one projection. The midline comprises three marking events. Examination of the intersections of the cross-hatched lines indicates that they were not executed as consecutive cross hatchings but that lines were made in first one direction and then another; the horizontal lines overlie the cross hatching.
Type of site	Cave site in limestone cliff on coast
Environmental conditions	The M1 phase (MIS 5a/4) occupation occurs during a period of falling sea levels (c. 60 – 70 m below present sea levels and 10-25 km from present coastline). *Donax serra*, a sand burrowing white mussel occurs in the M1 phase suggesting beach conditions in front of the cave. Densities of shell are lowest in this phase (17.5 kg per m^3) probably because of the distance of the coast from the cave.
Context	M1 phase. Layer CD, square H6a
Description of context	Surrounded by a number of small, basin-shaped hearths in a

	matrix of undisturbed and consolidated mixed ash and sand.
Associated finds	M1 phase lithics are typified by Still Bay type bifacial foliate points. More than 39 *Nassarius kraussianus* shell beads, another plaque of incised ochre, a few bone tools and an engraved bone came from this phase. A further seven engraved ochre pieces are under study.
Date range of site	140,000-70,000 BP
Dating method	Optically stimulated dating of the BBC hiatus aeolian dune by the multiple grain technique yielded a depositional age of 69,000 ± 5,000 BP and 70,000 ± 5,000 BP using synthetic aliquots. Thermoluminescence dates were obtained for five burnt lithic samples from the M1 phase. The mean age for the lithic samples is 77,000 ± 6,000 BP. An OSL age of 72,700 ± 3,100 BP was obtained for the M1 phase. Other dating methods, that have yielded similar ages for the Blombos MSA are electron spin resonance (ESR) and amino acid racemisation (AAR) Dates for the MSA levels using the uranium-series method are currently being processed by Prof. Stein-Erik Lauritzen at the University of Bergen, Norway.
View/Perception of Object	Portable object - 3D view
Source of Raw Material	The most likely source of the ochre siltstone is the Bokkeveld Group, the nearest outcrops of which are approximately 15 km northeast in the Goukou valley and 17 km west along the coast. Unusually, more than 25 pieces have single or multiple holes that were drilled by mussels (bivalves) when the ochre source was covered by the ocean during a previous high sea level. Crustacean growth is also visible on some ochre specimens.
Mode of production	Incised/engraved using a stone point - cannot find specific evidence of a particular tool at Blombos being used as engraving tool.
Microanalysis	Examination of the intersections of the cross-hatched lines indicates that they were not executed as consecutive cross hatchings but that lines were made in first one direction and then another; the horizontal lines overlie the cross hatching.
Interpretations	Deliberate abstract markings signify abstract thought and therefore modern human behaviour. They were made with symbolic intent and almost certainly had significance to the

makers and the transmission and sharing of the meaning of the engravings relied on fully syntactical language.

Current location

Iziko South African Museum
Cape Town
Catalogue No: SAMAA 8938

References

Henshilwood *et al*. 2001, 2002; Jones, 2001; d'Errico *et al.* 2003; Jacobs et al., 2003a, b; Henshilwood & d'Errico, 2005; Jacobs *et al*. 2006; Henshilwood, 2006; Tribolo *et al*. 2006; Henshilwood & Marean.

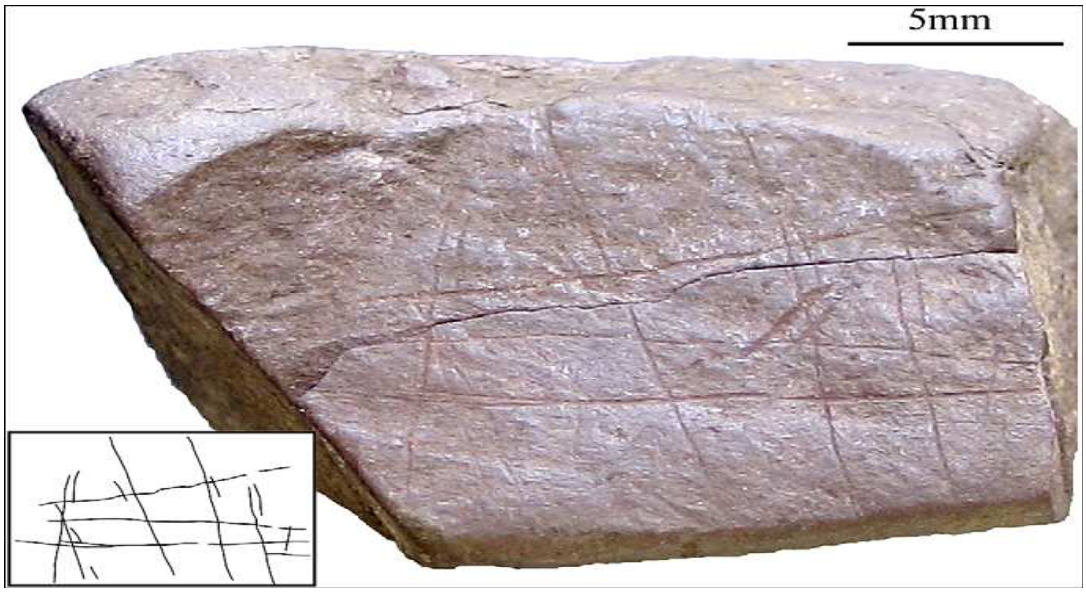
Cat 7b. Incised ochre SAMAA 8938, Blombos Cave

Image: Chris Henshilwood: Blombos Cave Project
http://www.svf.uib.no/sfu/blombos/

Catalogue No.	**8**
Site Name	Klein Kliphuis (KKH)
Location of Site	The shelter is located in the foothills of the Cederberg Mountains, approximately 7 km north of the town of Clanwilliam, and 200 km north of Cape Town. Western Cape, South Africa
Date of Artefact	50,000-80,000 BP
Object Type	Incised ochre
Dimensions	2.9 cm across through the centre of the long axis, with a height varying from 1.75 cm to 1.32 cm at the highest and lowest points respectively.
Description of object	The ochre is ground and fractured, and scored in a crosshatched manner with two horizontal and five vertical lines. The artefact has three faces, one of which is striated, another of which is scored, and the third of which exhibits characteristics of hertzian fracture. Like the Blombos ochre SAM-AA 8938, the KKH ochre has three dominant horizontal lines. The top and bottom lines diverge from left to right, while the central horizontal line runs broadly parallel to the bottom line. All three horizontal lines are composites, the results of multiple scoring events.
Material	Ochre
Type of site	Rock shelter site located in the foothills of the Cederberg Mountains.
Environmental conditions	The present day coastline is 60 km to the west. The shelter is formed in quartzitic sandstones, and is 18 m wide at its widest point, and 9 m deep from the drip line. Vegetation around the site is mountain fynbos. The shelter overlooks the Kliphuis River about 4 km from its confluence with the Olifants River, the major drainage system in the western part of the Cederberg Mountains.
Context	Layer D2
Description of context	The MSA deposit in square I1 was removed in four layers, denoted as D, D1, D2, and D3. D2 contained elements of both the HP and subsequent post-HP MSA, and included backed artefacts and a high frequency of silcrete; however, unifacial points were also present. It seems probable that in Layer D2 the HP and post-HP are mixed, perhaps unsurprising given the 25 cm thickness of the layer.

Associated finds	Associated with a mixed assemblage of Howiesons Poort and post-Howiesons Poort MSA artefacts. Scored lines could also be identified on other ochre pieces, in almost all cases these lines occurred on a surface that also showed grinding striations. As such, it was not possible to firmly distinguish these scored lines from those which might have arisen as a result of the grinding process.
Date range of site	80,000 - 1990 ± 50 BP
Dating method	Layer D2, in which the ochre was located, was assigned by Mackay (2006) to the Howiesons Poort and the early stages of the post-Howiesons Poort assemblages, commonly dating to between 50,000 – 80,000 BP.
View/Perception of Object	Portable object - 3D view
Source of Raw Material	Unknown
Mode of production	Scoring or engraving. A point of interest relates to the break at the right hand edge of the engraved face which truncates the lower horizontals. The break exhibits features of hertzian fracture initiating from the scored face, indicating that piece was broken by a hard hammer blow subsequent to scoring. It is possible that the break was accidental and resulted from dropping of the artefact, however, and without undertaking extensive experiments, the authors consider this unlikely.
Microanalysis	It does not appear that the face was prepared; rather it appears to have been naturally flat. The differences in line widths between the upper and lower horizontals on the one hand, and the verticals and central horizontal on the other, would appear to indicate that scoring did not occur as a single event, and that the different groups of lines were made either with a different implement, or at different times, or both. Where it is possible to ascertain the sequence of superimpositioning at the junctures of the horizontals and the verticals, the vertical lines generally appear to have been laid down first, followed by the central horizontal, and finally the upper and lower lines.
Interpretations	The formation of lines through a series of actions strongly implies an element of design, regardless of whether it was expediently formulated or realised over multiple stages. By design Mackay and Welz (2008) require only that the artisan(s) undertook the act(s) of scoring in order to give physical manifestation to a mental concept. The authors are cautious in interpreting this artefact as symbolic, and while their suspicion is that it is likely to be symbolic in some

	form to its maker, they accept the possibility that the motivations for engraving and breaking this particular piece were far more mundane including testing the fragment for pigment colour and/or breaking it up into more useable pieces.
Current location	Klein Kliphuis Collection, Iziko Museums, Cape Town
References	Van Rijssen, 1992; Mackay, 2006; Mackay and Welz, 2008



Cat. 8 Incised ochre, Klein Kliphuis

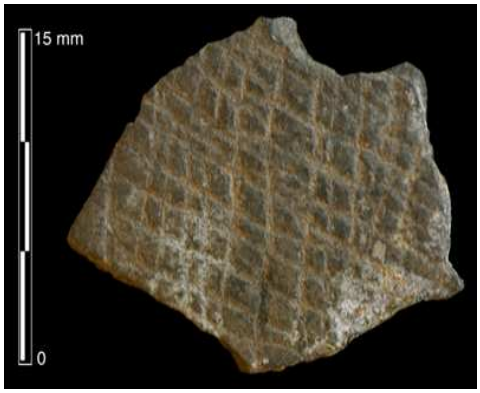
Image: Mackay and Welz, 2008

Catalogue No.	**9, 10, 11, 12a-I**
Site Name	Diepkloof Rockshelter
Location of Site	Approximately 180 km north of Cape Town and about 18 km upstream from the mouth of the Verlorenvlei River, near Elands Bay, in the Western Cape province, South Africa.
Date of Artefact	c.55,000 - 70,000 BP
Object Type	270 intentionally marked fragments of ostrich eggshell. Engraved ostrich eggshell (EOES)
Dimensions	Almost all of the ostrich eggshell fragments are less than 2.5 cm in maximum dimension.
Description of object	Diepkloof Rock Shelter provides an exceptional Collection of intentionally marked ostrich eggshell. In the last few years, excavators have unearthed a rich collection of engraved ostrich eggshell(EOES) fragments. These findings, added to the previously excavated sample of EOES from this site expand the collection of fragments to 270 pieces. This large collection of intentionally marked fragments displays a combination of variety and patterning. Some pieces are characterised by sets of parallel and acutely angled lines with interesting variations in the depth and breadth of the incisions. On other pieces, there are parallel lines infilled with hatching, and a few pieces show strongly defined grid patterns of intersecting lines. At least two of these intentionally marked ostrich eggshell fragments show the worn profiles typical of the mouths of ostrich eggshell water containers. This seems to imply that at least some of the intentional marking was applied to whole eggs and ones intended to have a substantial use in life as both storage and transport devices. The most recently found sample of EOES exhibits a set of four repetitive linear motifs in the form of a hatched band motif, a parallel to subparallel line motif, an intersecting line motif, and a cross-hatching motif. All these patterns share a common geometric concept. Because EOES pieces are fragmentary, it is possible that some of the geometric patterns were part of more complex motifs, although to date, only one pattern or motif has been found per fragment. The most common engraved motif consist of two long parallel lines intersected at roughly right angles by shorter, regularly spaced lines, forming a hatched band. The engraving of the motifs appears to have been standardised

	in that the maker began by engraving the long, parallel lines and then carefully engraving the shorter, sub-perpendicular cross lines, usually starting outside the defined band and crossing over the long parallel lines. (Catalogue Image 12ii)
Material	Ostrich eggshell
Type of site	Rockshelter
Environmental conditions	Diepkloof is about 17 km from present shoreline. Several fragments of a crustacean and specifically the *coronula diadema*, which is a parasite that attaches itself to the hide of the humpback whale, were discovered in HP levels pointing to the presence of this giant mammal off the coast of Elands Bay during the MSA. Some seashells and fur seal bone remains were found in the same levels. Faunal remains comprise 25 species in all, including the fur seal (*Arctocephalus pusillus*), an insectivore (*Erinaceus frontalis*), a lagomorph, the water rat, two primate species, including dental fragments that are attributable to *Homo sapiens*, 5 species of carnivore, including a large cat (*Panthera pardus*), 2 species of equidae, and 9 species of bovids of varying size. Two other large herbivores include *Hippopotamus amphibius* and a *Rhinocerotidae.* Throughout the sequence, the quality of organic preservation is exceptional, including the presence of various vegetal remains (wood, grass, seeds and fruits), which currently are under intensive study using field emission scanning electron microscopy. The Howiesons Poort botanical remains have yielded evidence for thicket or shrubland vegetation. Also present ate Afromontane forest taxa. The presence of Ficus sp (collectively know as fig trees) indicates a much more diversely wooded riverine community fringing the palae-river that forms the present-day Verlorenvlei.
Context	More than 80 pieces of ostrich eggshell that are engraved were located in Complex 3.
Description of context	The deposits contain more than 50 excavated stratigraphic units, each sequence is divided into six ‘Complexes’, which were numbered 1 (top) to 6 (bottom). The following archaeological sequence has been observed: Complex 1: distributed across the surface of the shelter - LSA stone tool assemblage dating to the last 1800 years. Complex 2: an MSA stone tool assemblage characterized by retouched unifacial points and convergent scrapers, post-Howiesons Poort.

	Complex 3: an MSA assemblage of Howiesons Poort type with numerous curved backed blades, side scrapers, notches and denticulates, end scrapers and numerous fragments of ostrich eggshell bearing marks of parallel incisions and cross hatchings Complex 4: an MSA Howiesons Poort type assemblage like that above, but in which the ostrich eggshell fragments, whilst still numerous, are not incised. Complex 5: an MSA assemblage characterized by foliate bifacial points, attributed to the Stillbay industry. Complex 6: an MSA assemblage not yet characterised at this stage. Bedrock has not been reached. The excavation trench extends 16m across the site including a section 3.6m in depth. The main section exposes one of the most complete and continuous later MSA sequences in southern Africa, dating from before 130,000 years ago to about 45,000 years ago and encompassing pre-StillBay, StillBay, Howiesons Poort, and post Howiesons Poort occupations. Although ostrich eggshell fragments are documented throughout the sequence, EOES are associated only with several layers within the Howiesons Poort complex. The majority of the recently recovered pieces of EOES were collected from two distinct stratigraphic units (*Frank* and *Darryl*), but the overall stratigraphic distribution is slightly broader, encompassing 18 stratigraphic units.
Associated finds	Howiesons Poort stone tool assemblage and bright red, worked ochres
Date range of site	70,000 – 1800 BP
Dating method	Optically Stimulated Luminescence **(**OSL**)**
Source of Raw Material	Not confirmed, but probably local. Ostrich breeding and egg-laying season starts in Autumn (March-April) and continues until September. One female may produce as many as 13 eggs and with all the hens laying eggs in one nest 30 to 40 may accumulate. Only about 20 eggs can be successfully hatched, however, so the rest are pushed out of the nest and destroyed. (Von Schirnding *et al.* 1982:5)
Mode of production	Two kinds of marking are discernible, although within this, there is a significant diversity in marking form. There are some cases of moderately deep, U-shaped gouging of the surface leading to the removal of the uppermost ostrich eggshell layer. The edges of gouges are often marked by spalling or splintering. In contrast are cases where finer V-shaped incisions have been made into the surface with little

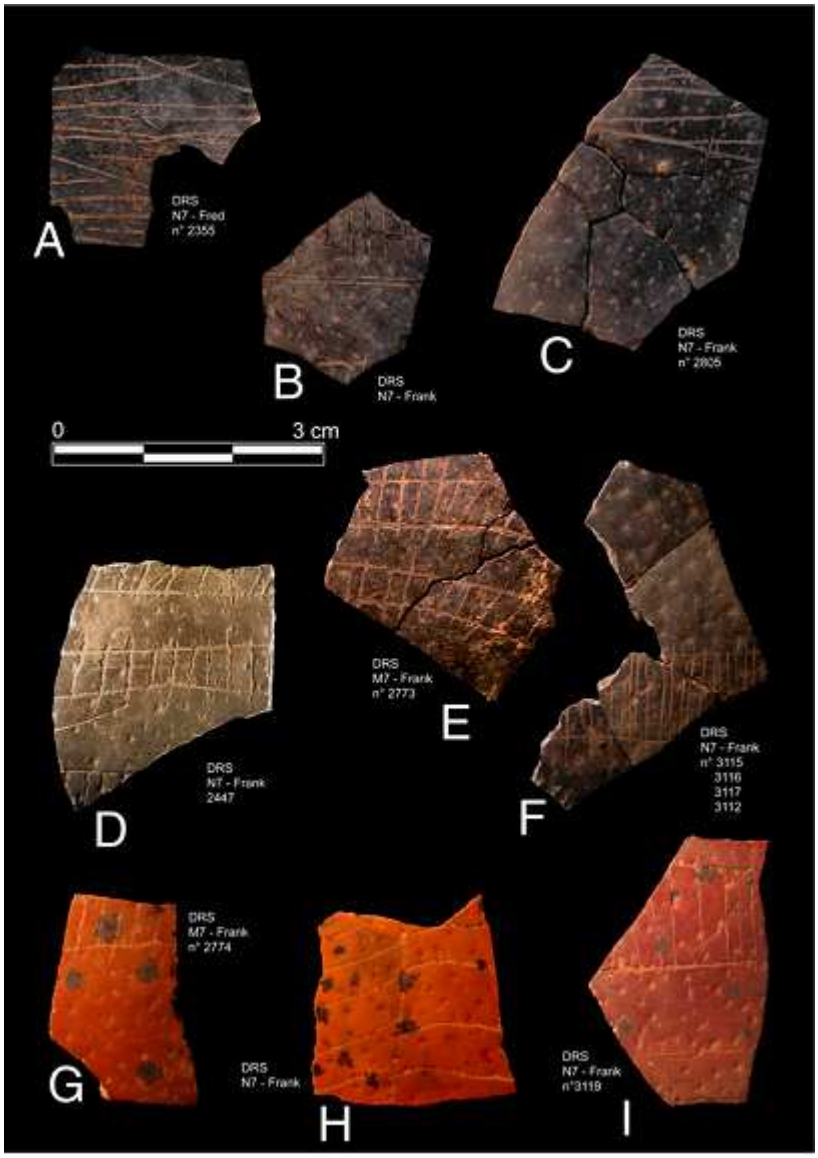
	removal of material from the egg surface. These markings currently are referred to as gouges and incisions respectively. Gouges seem to have been produced by a blunter point.
Microanalysis	EOES were observed and photographed using high-power microscopy to confirm the sequence of incisions and directions diagnosed at 10x to 70x magnification.
Interpretations	The large sample size of EOES documents a small range of geometric motifs that introduces the notion of group identification and individual expressions. The manipulations of a small range of motifs and the diachronic changes in motifs are persuasive evidence for symbolic expression. The large sample size of the EOES, ist well-documented context, and the unequivocal nature of the markings offer a unique opportunity to study what constitutes the most reliable collection of an early graphic tradition. Engraved abstract patterns are widely accepted as evidence for the presence of symbolic thought. The number of EOES at Diepkloof is exceptional (n+270) and has not equivalent in the current archaeological record. According to the stratigraphic distribution of the EOES throughout the 18 stratigraphic units, and considering both the diversity of the motifs and the stylistic variability of each piece, it is possible to propose a minimum number of 25 EOES containers. The Howiesons Poort graphic tradition at Diepkloof is found on functional items: containers that probably were used to store liquids such as water. These objects were used daily, were curated, and were elements of a collective and complex social life. For these reasons, ostrich eggshell provided an ideal surface for informative marking, such as self or group identification.
Current location	Dept. of Archaeology, University of Cape Town
References	Von Schirnding *et al.* 1982; Parkington *et al*. 2005; Rigaud *et al*. 2006; Texier *et al*. 2010



Cat Refs:

Cat. 9 (Top right)
Cat. 10 (Bottom right)
Cat. 11 (Top left)
Incised Ostrich Eggshell, Diepkloof

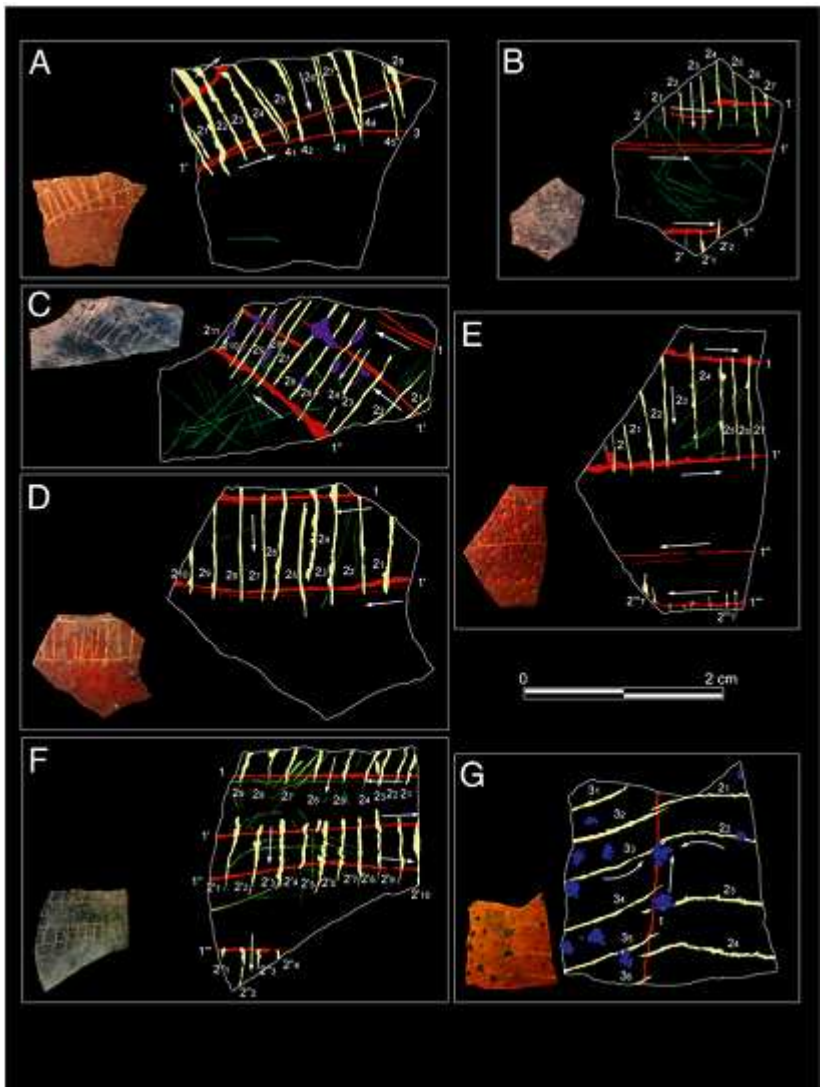
Image: (3 images above) France Diplomatie: Diepkloof Project http://www.diplomatie.gouv.fr/en/france-priorities_1/archaeology_2200/archaeology-notebooks_2202/africa-arabia_2240/south-africa-diepkloof-project_6554/the-archaeological-site-and-its-history_11840.html



Cat. 12 a – i: Incised Ostrich Eggshell, Diepkloof

Image: Texier *et al*. 2010

Except for A all the fragments belong to the same stratigraphic unit (layer Frank). Fragments A and C show a series of deeply engraved, straight, sub-parallel lines. B, D-G and I show a hatched band motif. D has evidence of three separate hatched bands. Fragment H shows slightly curved lines crossing a central line.



Cat.12ii: Incised Ostrich Eggshell, Diepkloof

Image: Texier *et al*. 2010

Engraving sequences of ostrich eggshells at Diepkloof. Numbers indicate the relative chronology of the patterns; arrows show the direction of the incisions. The engraving sequence of the hatched band motif (A-F) is standardised in that the hatched lines always postdate the band (horizontal lines). Motif G consists of slightly curved lines that cross a central line. The curvature of the sub-perpendicular lines is reversed on either side of the central line.

Catalogue No.	**13**
Site Name	Boomplaas
Location of Site	Swartberg Range, South Africa, near the southern most tip of the continent, 75 km inland from the coast. The Boomplaas Cave is perched some 60m above the floor of the Cango Valley.
Date of Artefact	44,000 ± 4,000 BP
Object Type	One complete and one unfinished ostrich eggshell bead
Dimensions	Unknown
Description of object	One complete and one unfinished ostrich eggshell bead
Material	Ostrich eggshell
Type of site	Cave site
Environmental conditions	The occupation deposits at Boomplaas represent very intermittent occupation. It can be postulated that a cave site like Boomplaas was occupied as and when it served as a convenient base for a set of specific activities. Among the most prominent faunal remains in the cave deposit are those of micro-mammals derived from the roosting of barn owls. There are modern roosts in the same outcrop as the cave and elsewhere in the valley, which have been sampled as a control. The larger mammal fauna is much depleted in the valley and there is not the same potential for modern control studies. However, there is at least one known Upper Pleistocene carnivore lair which is being sampled as a contrast to human predation as represented in the Boomplaas Cave deposits
Context	A small area of seven square metres was excavated through the Middle Stone Age layers. The succession of stratigraphic layers relating to the MSA is BP, OLP, BOL, OCH and LOH. Layer OLP is dated to around 42,000 BP and correlates with the date of the ostrich eggshell bead. Layer OLP is a thin discrete occupation event and indicates low intensity use of the site.
Description of context	The accessible surface area of the cave is some 225 m^2. In the well-stratified sandy loams that make up the deposit, horizons of human occupation are marked by carbonized and humified organic matter and ash and these contrast with the alternating, culturally sterile, red-brown loams built up by natural processes, some of which are rich in

	roof spalls and some of which contain abundant micromammal bones derived ultimately from owl pellets. Howiesons Poort occupation is located near the bottom of the site stratigraphy.
Associated finds	Anatomically modern human skeletons
Date range of site	Site deposits dating between 70,000 and 1500 years ago in a thickness of some five meters of human occupations, dated between the Middle and Late Stone Ages (Middle and Late Palaeolithic).
Dating method	Dating by Amino Acid Racemisation (AAR) on an ostrich eggshell fragment gives an age of 44,000 ± 4,000 BP Two radiocarbon dates on charcoal give an age of >40,000 BP (UW 305) and 37.4±1.37 ka (Pta-1811) respectively; the third radiocarbon date, obtained from a speleothem, provides an age of 31.68±5.5 ka (Pta-2302). The Uranium/Thorium (U/Th) dating, also on speleothem, gives 35.2±2.6 ka (U-366).
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	See Wingfield, 2003
Microanalysis	None undertaken
Interpretations	Evidence of modern human behaviour
Current location	Transvaal Museum, Pretoria, South Africa
References	Fairhall *et al*. 1976; Avery, 1977; Deacon 1979, 1995; Miller *et al*.1999, Vogel, 2000
Image	No image available

Catalogue No.	**14**
Site Name	Enkapune Ya Moto (EYM) also known as 'Twilight Cave'
Location of Site	The shelter lies at about 2400 m on a steep slope in a large incised gully on the eastern face of the Mau Escarpment, above the Naivasha basin, which constitutes the western wall of the Rift Valley in Kenya.
Date of Artefact	37,000 – 39,000 BP
Object Type	Ostrich eggshell beads
Description of object	13 complete beads, 12 bead preforms and 593 bead fragments were discovered.
Material	Ostrich eggshell
Type of site	Rock shelter
Environmental conditions	The base of the Rift Valley is covered primarily by grasslands with scattered pockets of bush and woodland. In the Naivasha basin most of the grass is dry and tall, due to the low rainfall and low grazing intensity, and is barely palatable for many ungulates except during the wet seasons. Given environmental conditions similar to those of today, the site was probably surrounded by forest prior to the advent of pastoralism. The context from which the ostrich eggshell comes reflects high intensity occupation, including evidence of on-site manufacture of ostrich eggshell beads, probably during a warm phase of MIS 3.
Context	Ostrich eggshell beads come from layer DBL1
Description of context	Two early LSA horizons have been identified: DBL and GGOL. A large sample of carbonized sediment and decomposed charcoal from a hearth, submitted for dating 6 months after excavation, dates to 41,400 ± 700 BP.
Associated finds	The associated lithic industry contains low frequencies of thin, part-bifacially flaked small knives, flattened discoids, discoidal cores and faceted platform flakes, which are typical of MSA and Second Intermediate industries.
Date range of site	Occupations dated between 40,000 and 1300 years ago.
Dating method	Ostrich eggshell from DBL1.3 (the base of DBL1) produced radiocarbon dates of 37,000±1100 BP and 39,900±1600 BP on the shell exterior and interior, respectively. The latter date is more reliable because it is on the shell fraction best protected from contamination.

View/Perception of Object	Various fragments of ostrich eggshells in different stages of the manufacturing process.
Source of Raw Material	Ostrich breeding and egg-laying season starts in Autumn (March-April) and continues until September. One female may produce as many as 13 eggs and with all the hens laying eggs in one nest 30 to 40 may accumulate. Only about 20 eggs can be successfully hatched, however, so the rest are pushed out of the nest and destroyed.
Mode of production	See Wingfield, 2003
Microanalysis	None
Interpretations	Interpreted as a symbolic trade item between neighbouring hunter-gatherer groups - maintain contacts and potential allies against famine and scarcity.
Current location	National Museum of Kenya
References	Von Schirnding *et al*. 1982; Marean, 1992; Ambrose, 1998

Cat 14: Ostrich Eggshell, Enkapune Ya Moto

Image: Randall White, 2003

Catalogue No.	**15a, 15b, 15c**
Site Name	Border Cave
Location of Site	Lebombo Mountains, located between South Africa and Swaziland, in Kwazulu Natal, South Africa.
Date of Artefact	c. 40,000 BP
Object Type	Pierced shell / 2 Ostrich eggshell beads Broken bored stone with incised notches bordering orifice
Dimensions	Ostrich eggshell beads are 5-6 mm in diameter *Nassarius* shell is 7.5 mm in diameter. Bored stone – estimated original diameter is 6 cm.
Description of object	2 completed ostrich eggshell beads. Perforated *Nassarius kraussianus* shell. Broken bored stone is circular or curved in shape, exhibiting eight incised notches bordering the orifice, which is quite thick in appearance; it does not appear to be part of a vessel.
Material	Ostrich eggshell *Nassarius kraussianus* shell Stone
Type of site	Rockshelter
Environmental conditions	The cave's mouth opens west towards the Lembodo Mountains. These mountains are 650 meters in height and stretch north and south along 35 km wide Loweld plain. At the steps of the mountain, there are steep cliffs and escarpments. The major river of Ngwavuma River cuts through the Lembodo Mountains. Border Cave is circular in shape and is 40 m in width. The coast is 80 km east of the site.
Context	Found in layers dating to 'Early Later Stone Age' >33,000 - ~ 38/45,000 BP Stratigraphy Ref: IBS.LR and IWA
Description of context	The Early Late Stone Age correlates to the First Brown Sand (Lower) and the First White Ash layers in Excavation 3A, and the superficial levels of the surface rubbly brown sand in Excavation 3B.
Associated finds	Anatomically modern *Homo sapiens* skeletons as well as stone tools and chipping debris were found at Border Cave.

Date range of site	Site deposits include Middle to Late Stone Age Transition (ca. 30,000 to 50,000 years ago), and Middle Stone Age Howiesons Poort occupations (45,000 to 75,000 years ago).
Dating method	The twenty-four 14C dates from these layers, ranging between 33,000 and 39,800 are consistent with Electron Spin Resonance (ESR) dates for the same layers
Source of Raw Material	The source of the *Nassarius* shells lies on the coast, 80 km east of the site. The ostrich eggshell and stone are likely to be locally sourced.
Mode of production	See Wingfield, 2003 for ostrich eggshell bead production. See d'Errico *et al*. 2005 for technique in perforating *Nassarius* shells.
Microanalysis	None
Interpretations	Evidence of modern human behaviour.
Current location	McGregor Museum, Kimberley, South Africa
References	Beaumont, 1973; Beaumont, de Villiers, & Vogel, 1978; Grün & Beaumont, 2001.

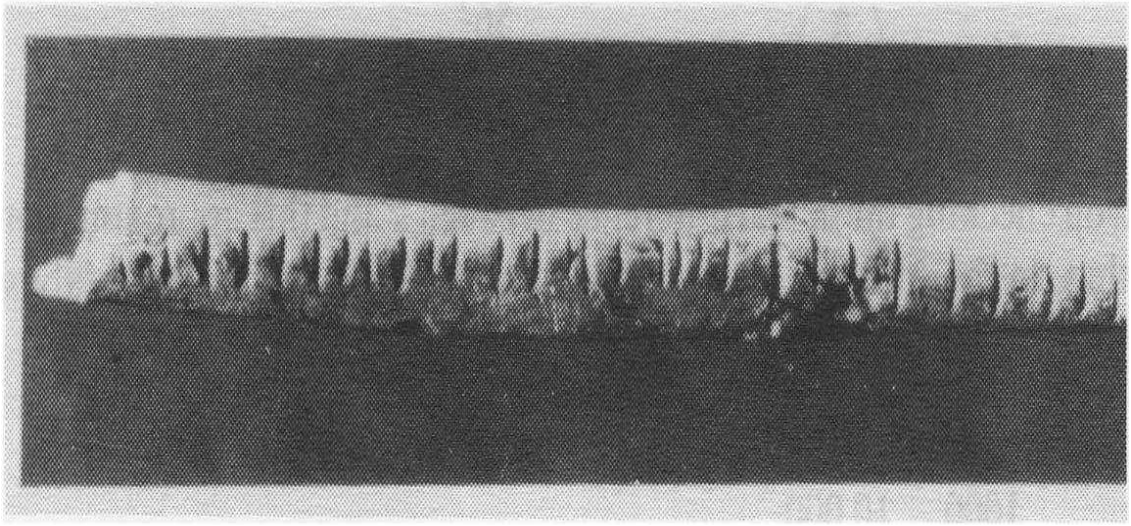
Cat 15a.(Left) Ostrich eggshell beads Cat 15b(Right) Perforated shell, Border Cave

Cat 15c.Bored stone, Border Cave

Images: White, 2003

Catalogue No.	**15d**
Site Name	Border Cave
Location of Site	Lebombo Mountains, located between South Africa and Swaziland, in Kwazulu Natal, South Africa.
Date of Artefact	35,000-37,000 BP
Object Type	Lebombo Bone
Dimensions	Length 7.7 cm
Description of object	Marked with 29 clearly defined notches
Material	Baboon fibula
Type of site	Rockshelter
Environmental conditions	The cave's mouth opens west towards the Lebombo Mountains. These mountains are 650 meters in height and stretch north and south along 35 km wide Loweld plain. At the steps of the mountain, there are steep cliffs and escarpments. The major river of Ngwavuma River cuts through the Lembodo Mountains. Border Cave is circular in shape and is 40 m in width. The cave is at present 80 km from the sea, and was without doubt further removed from it at the time when the First White Ash accumulated (35,000-36,000 BP)
Context	First White Ash layer
Description of context	This layer consists of a marked and continuous white ash and an underlying series of interdigitating white and black ash and brown sand lenses.
Associated finds	Anatomically modern *Homo sapiens* skeletons as well as stone tools and chipping debris were found at Border Cave.
Date range of site	Site deposits include Middle to Late Stone Age Transition (ca. 30,000 to 50,000 years ago), and Middle Stone Age Howiesons Poort occupations (45,000 to 75,000 years ago)
Dating method	Radiocarbon dating
Source of Raw Material	?
Mode of production	Engraved/incised lines made in continuous row on bone
Microanalysis	None undertaken

Interpretations	It has been noted that the long bone resembles calendar sticks still in use today by Bushmen in Namibia.
Current location	?
References	Louw, 1969; Beaumont 1973; Plug, 1982; Bogoshi *et al.* 1987



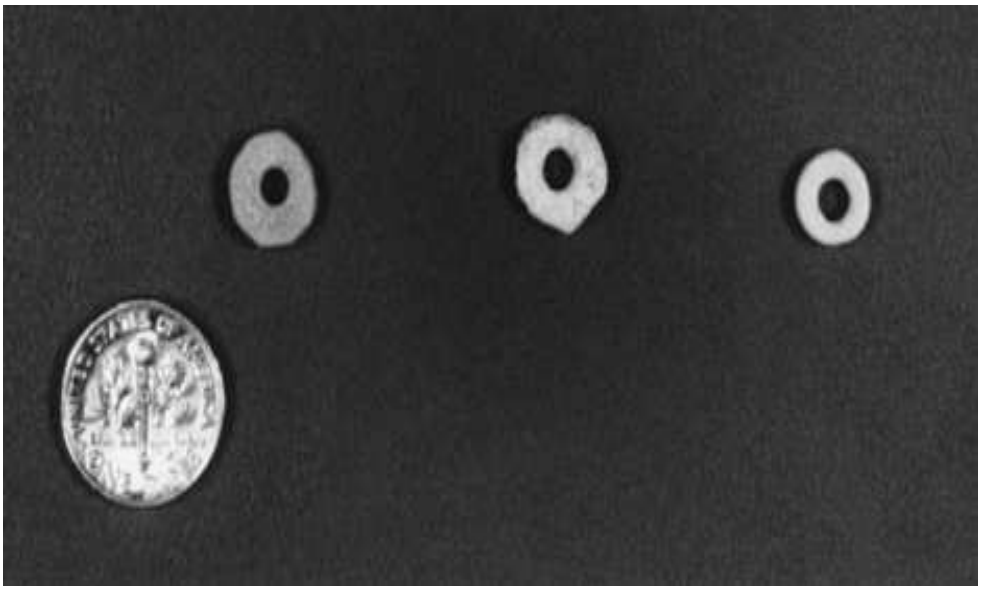
Cat 15d: Notched bone, Border Cave

Image: Bogoshi, Naidoo & Webb, 1987

Catalogue No.	**16**
Site Name	Kisese II
Location of Site	Tanzania, East Africa
Date of Artefact	31,480 BP
Object Type	Ostrich Eggshell beads
Material	Ostrich eggshell
Type of site	Rockshelter
Environmental conditions	?
Context	MSA/LSA transition
Description of context	?
Associated finds	Associated with transitional MSA/LSA lithic industries
Date range of site	
Dating method	Radiocarbon dating on eggshell
Source of Raw Material	Probably local
Mode of production	See Wingfield, 2003
Microanalysis	None undertaken
Interpretations	Evidence of modern human behaviour
Current location	?
References	Innskeep, 1962; Deacon, 1995
Image	No image available

Catalogue No.	**17**
Site Name	Mumba
Location of Site	Tanzania. Between 3-4 km east of the northeastern shore of Lake Eyasi, which lies about 65 km south of Olduvai Gorge in the Rift Valley of Northern Tanzania
Date of Artefact	29,000 – 33,000 BP
Object Type	Ostrich Eggshell beads
Material	Ostrich eggshell
Type of site	Rockshelter. The Mumba shelter is formed by a rock face with a lateral extent of about 20 m and an overhang of approximately 9 metres.
Environmental conditions	Mumba Cave is situated in an excellent position for exploitation of animals of the open grassland and old lake terraces as well as animals that prefer the moister environment of the stream courses and swamp edges. When the site was occupied, the environment was similar to the current ecological zone of this area. Lehmann identified a richly diverse array of fauna from Bed III, including baboon, rabbit, porcupine, aardvark, zebra, warthog, steenbok, dik-dik, impala, gazelle (both Thompson's and Grant's), also cormorant and guinea fowl, tortoise, lizard/snake and frog. Species in Bed III represented by less than six bones each include chimpanzee, spring hare, a range of carnivores, hyrax, black rhino, white rhino, bush pig, hippo, giraffe, greater kudu, bushbuck, eland, buffalo, reedbuck, waterbuck, roan antelope, oryx, wildebeest, klippspringer, pelican, ?goose, ?fish eagle, falcon, crane, monitor lizard, python.
Context	Layer III
Description of context	The cave’s sediments were subdivided into six units. Beds III, V and VI were each dug in 20 cm. spits.
Associated finds	From the base of lower Bed III of the Mumba rock shelter sequence, where a face fragment, phalanges, fibula and a femur fragment of a single human individual (known as Mumba Burial X) were found. This individual is thought to have been 40 years old at death and possibly a female. Stone artefacts of early LSA tradition, known as the “Naseran” industry, also occur in lower Bed III. At Mumba rock shelter, this industry is characterised by a rarity of points and backed pieces. Large quantities of ostrich

	eggshell fragments and beads, and several bored stone balls, land snail shell fragments, and a wide range of modern fauna occur in association with this industry.
Date range of site	Excavated by Kohl-Larson in 1938, the site has produced over 9 metres of cultural deposits, ranging from the MSA to the Iron Age.
Dating method	Lower Bed III is dated by C-14 (Lab. # ISGSS-566) on eggshell to 27,000 years BP and by amino acid racemisation to 37,000–30,000 years BP.
Source of Raw Material	Probably local
Mode of production	See Wingfield, 2003
Microanalysis	None
Interpretations	Evidence of modern human behaviour
Current location	?
References	Mehlman 1979; Brauer, 1980; Mabulla, 2007

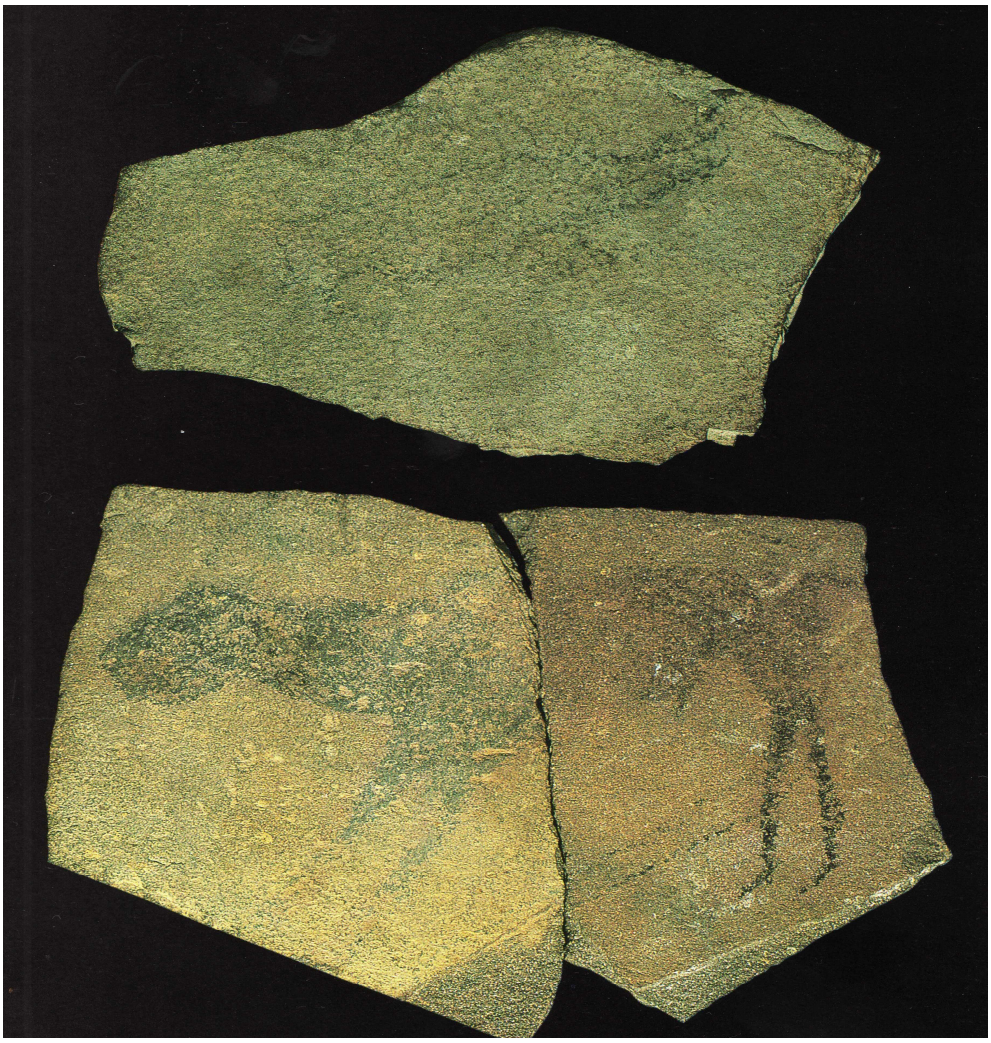


Cat 17. Ostrich eggshell beads, Mumba

Image: McBrearty and Brooks, 2000:522, Fig. 9b

Catalogue No.	**18**
Site Name	Apollo 11 Cave
Location of Site	Located on a tributary of the Orange River, Huns Mountains in Southwestern Namibia. 27˚45'S, 17˚6'E
Date of Artefact	28,500 ± 450 and 26,300 ± 450 BP
Object Type	Painted stone slabs
Dimensions	*Top Image (below)* Length: 6.4 cm Height: 5.7 cm *Bottom Image(below)* Length: 6.4 cm Height 6.4 cm
Description of object	Seven painted stone slabs of brown-grey quartzite depicting a variety of animals. The slab consisting of two broken fragments bear the black drawing of a quadruped. Interpreted as feline in appearance, it is thought to depict, “a pair of obviously human legs which seem to have been drawn at a later date in place of the already faded original bent hind legs”. There are probably also two slightly curved horns visible, and a feature possibly representing genitals, which “add some bovine traits to this ‘composition’”. Another fragment depicts an ambiguous white, black-striped animal, interpretations such as zebra, giraffe or ostrich have been considered. The most characteristic trait is a certain “stiff, long-leggedness”, and in the author’s opinion, despite the proportions, a zebra is the most likely interpretation.
Material	Painted in charcoal, ochre and white on local stone.
Type of site	Cave site
Environmental conditions	The cave is located in a boulder-strewn gorge in the Ai Ais-Richtersveld Transfrontier Park in Namibia. To the north of gorge is an extensive plain fringing the escarpment to the Huns Mountain massif to the east, and to the south is a sequence of ridges and valleys, also of the Huns massif, leading down to the perennial Orange River about 40 km away. It is a parched landscape, where the sparse flora and fauna are sustained by occasional late summer thunderstorms that create short-lived flash floods in the

	gorge, and revive the semi-permanent springs which trickle from the base of the limestone cliffs. The gorge was subjected to the succession of relatively wetter and drier periods, which occurred throughout the Quaternary. The wetter episodes, although shorter and of varying intensity, made prehistoric occupation possible in an otherwise predominantly inhospitable environment.
Context	Found in Layer E, Square A9.
Description of context	Recovered from a 'concentration', covering about 1.5m², and initially thought to be parts of an exfoliated 'frieze' which once existed somewhere on the walls or ceiling of the cave.
Associated finds	Layer E stretches over more than 20,000 years. Owing to the relatively scarcity of artefacts in general and of typical tools in particular throughout this layer, no marked differences within this ‘unit’ are obvious. One edge-damaged blade bearing traces of mastic around the basal third of its length is worth mentioning.
Date range of site	Stratigraphic and Radiocarbon dating confirms several cycles of occupations in this cave dating back at least 70,000 years.
Dating method	Radiocarbon dated to between 26,300 ± 400 – 28,400 ± 450 BP
Source of Raw Material	The rock type, grey-brown quartzite, strewn in large quantities along the track in the gorge to the cave and at the base of the black limestone cliffs, reveals slabs of varying sizes and thickness.
Mode of production	Painted
Microanalysis	Analysis suggests they were deliberately broken.
Interpretations	Interpreted as 'art mobilier' and not simply as parts of an exfoliated 'frieze' which once existed somewhere on the walls or ceiling of the cave. Deliberately broken. Wendt's discovery of the slabs does not exhaust the potential of Apollo 11 Cave and its immediate surroundings as an important source of additional rock art information not hitherto explored.
Current location	State Museum of Namibia
References	Wendt, 1972, 1976; Masson, 2006



Cat 18. Painted stone slabs, Apollo 11 Cave

Image: White, 2003: 159 (Ill. 131 and 132)

Catalogue No.	**19**
Site Name	Patne
Location of Site	Maharashtra, India. The area of Patne forms part of the Deccan Trap region of Maharashtra.
Date of Artefact	25,000 ± 200 BP
Object Type	Engraved ostrich eggshell
Dimensions	The length of the incised ostrich eggshell is c. 3 cm in length. The finished ostrich eggshell bead from Phase II D is 1 cm in diameter.
Description of object	The object shows horizontal bands of trellis pattern between horizontal lines.
Material	Ostrich eggshell
Type of site	Open air site - permanent settlement
Environmental conditions	Monsoonal shifts during the Pleistocene and marked seasonal changes in wet and dry periods are thought to have structured hominin settlement behaviours. In the Later Pleistocene as today, South Asia's variable ecology and landscape provided a wide range of potential settings for hominin adaptations. Archaeological evidence clearly indicates Later Pleistocene occupation throughout the subcontinent, including the settlement of both coastal and estuarine environments.
Context	The incised ostrich eggshell was found in Phase II D. One finished and two unfinished beads of ostrich eggshell and one perforated shell were found in Phase D and E respectively.
Description of context	Period II equates with the Upper Palaeolithic. On the basis of stratigraphy and difference in tool varieties this period has been subdivided into five phases, IIA, IIB, IIC, IID and IIE.
Associated finds	This phase shows a heavy concentration of artefacts, yielding 12,301 pieces. A total of 157 fragments of ostrich eggshell were collected from the deposits of the Upper Palaeolithic. Phase II A = 6 pieces; Phase II B = 1 piece; Phase II C = 1 piece, Phase II D = 118 pieces and Phase II E = 31 pieces. Among the 118 pieces from Phase II D two were found to have been engraved with a design, one is a bead and two are discoidal pieces representing unfinished

	beads. Most of the ostrich eggshell pieces are covered with patches of calcium carbonate. They are cream coloured, with pitted upper surface and quite thick exceeding in most of the cases 1 mm. The Upper Palaeolithic industry at Patne is dominated by blades, scrapers, points and borers. Blades and burins may be regarded as the characteristic forms, as they are in Upper Palaeolithic industries of Europe and Western Asia.
Date range of site	Advanced Middle Palaeolithic to Mesolithic. Period I, Advanced Middle Palaeolithic = c. 40,000 BP; Period II, Upper Palaeolithic = c 35,000 BP - 10,000 BP and Period III, Mesolithic = c. 10,000 - 6,000 BP.
Dating method	Radiocarbon dated at the Laboratorium voor Algemne Natuurkunde, Rijksuniversiteit, Groningen, Netherlands.
View/Perception of Object	The engraved ostrich eggshell is only 3 cm in length and difficult to know the extent of the original finished object, whether this was part of a water container or object of personal ornamentation. However, the design is very structured.
Source of Raw Material	A few pieces were sent to the Director of the British Museum for identification. Dr C.J.O. Harrison, Senior Scientific Officer, Sub-Department Ornithology examined them, remarking that the fragments are referable to the genus, *Struthio*, and possible to *Struthio camelis*. According to P. Broskerb in his catalogue of fossil birds, part 1, *Struthio asiaticus* is listed from the Lower Pliocene of India, *Struthio anderssoni* from Upper Pleistocene of China and Mongolia. It would not be surprising if a large Ostrich had existed in India at this period. The perforated shell is of estuarine origin and of *Oliva sp*. How this shell of estuarine origin has reached 300 km away from the West Coast to Patne is a matter worth investigation.
Mode of production	The hole in the shell has been bored from the inner surface of the piece. The hole is circular and seems to have been drilled with a tool having a fine point or a borer by fully rotating it as is evidenced from the occurrence of a circular depression around the hole with obliquely sloping sides.
Microanalysis	The unfinished ostrich eggshell beads are discoidal pieces slightly smaller in size than that of the marine shell. The surface of one of these bears a tiny depression suggesting that an attempt was made to bore a hole in it.

Interpretations

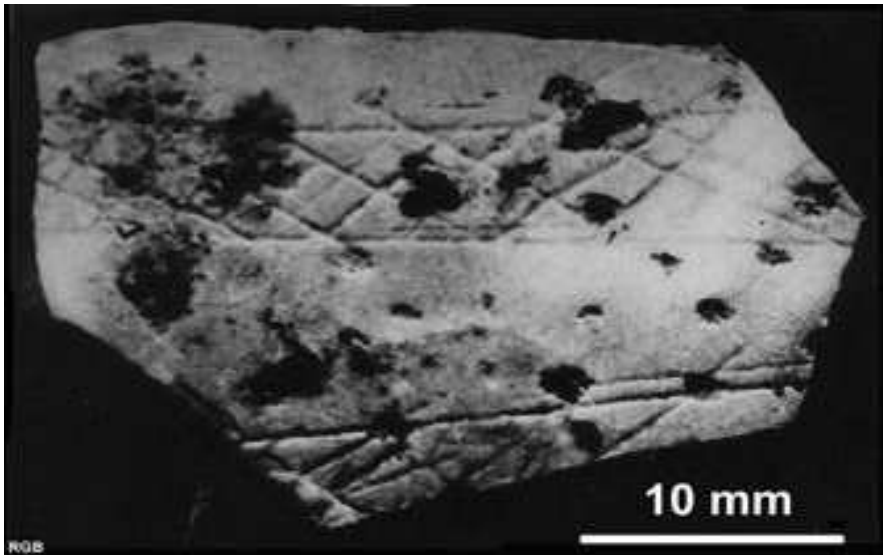
"The engraved designs, simple though as they are, represent the direct evidence of artistic pursuit of the Upper Palaeolithic man at Patne. They also represent the first direct evidence of the Upper Palaeolithic art in India." (Sali, 1989:86) Sali suggests that the artists must have been fully acquainted with the design of a trellis for it to be transferred on to ostrich eggshell. "Can it be that he became well-familiar with this pattern while erecting his hut by trellising branches of trees? It is doubtful that Upper Palaeolithic man at Patne lived in the open without erecting some modest type of shelters such as the huts made of branches and trees and leaves. Perhaps his living site was enclosed by trellising...It is not unlikely that trellis pattern may make one think about the art of weaving, however crude it might look. The beads recovered from the levels of this culture at Patne further substantiate this view. Because they have to be put in a thread and preparation of thread is the first stage of weaving." (Sali, 1989:101)The occurrence of estuarine shell from 300 km away indicates long distance contacts of Patne man in this period. The beads found in Upper Palaeolithic levels at Patne represent the first and earliest examples of ornaments of the Palaeolithic so far found in India. These finds clearly suggest that Upper Palaeolithic people in India wore body ornaments of bone and shells like those contemporary in Europe and Western Asia.

Current location

Deccan College Post Graduate and Research Institute

References

Sali, 1980, 1985,1989; James & Petraglia, 2005



Cat 19. Engraved Ostrich Eggshell, Patne

Image: Sali, 1989

Catalogue No.	**20**
Site Name	Bacho Kiro
Location of Site	Situated 5 km west of the town Dryanovo, Bulgaria
Date of Artefact	Radiocarbon dating from Layer 11, cultural level I (charcoal from 356-357 cm) = > 43,000 BP (GrN - 7545)
Object Type	Pierced bear canine and fox incisor
Dimensions	?
Description of object	Intentionally perforated incisors of bear and fox
Material	Incisor teeth
Type of site	Cave site
Environmental conditions	The period represented by Layer 11 indicates a warm period linked with the Heraklitsa interstadial. Layers 11a and 11 contain evidence of warming of the climate and of a further increase in humidity. The quantity of mountain and steppe rodents declines, and there are still few forest forms. *Pitymys subterraneus*, the European Pine Mole is more numerous than the species *Microtus arvalis*, the Common Vole, connected mainly with dry environments. In layer 11 the remains of fish were also found. The mole occurring here, *Talpa europaea*, is associated with damp meadows, and the bat *Myotis dasycneme* with water. The polar fox and ermine are still present.
Context	Layer 11 is represented by at least 4 cultural levels with clearly defined hearths and traces of simple camp structures. The teeth were found in layer 11/II - in this level three groups of hearth structures were found.
Description of context	Layer 11 is the early stages of the Aurignacian, designated as the 'Bachokirian'. It is distinguished by the lack of bone points and by its early chronological position. This stage however does not reveal any link with the local Middle Palaeolithic substratum, since from the technological point of view it has a fully developed Upper Palaeolithic method of blank production (with no tradition of Levallois technique), and an extremely low count of Middle Palaeolithic typological elements
Associated finds	Retouched flakes, end-scrapers, splintered pieces, as well as burins, truncations and notched pieces. Sample 1124, in layer 11/IV is the preserved fragment of a human mandible

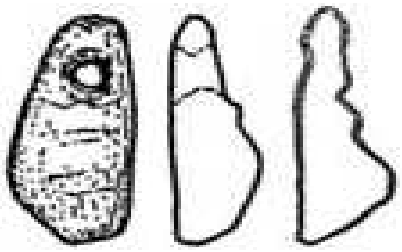
	with the first deciduous molar. A fragment of the deciduous canine alveolus 'c' is visible, as well as a small fragment from the anterior wall of the medial root belonging to the second deciduous molar 'm2'. The occlusal surface of the preserved milk tooth is relatively worn, revealing the dark coloured dentin. The tooth belonged to a child who died at the age of 7 yrs.
Date range of site	Research has established the cave was visited approx. 20 times by Middle and Upper Palaeolithic population groups; their respective sojourns are marked either by single artefacts or by well-expressed cultural layers with preserved elements of the original structure of camps or hearths.
Dating method	Radiocarbon dating
View/Perception of Object	Probably suspended and used as a form of personal ornamentation
Source of Raw Material	The remains of bear, especially of the tooth crowns, point to the brown bear *Ursus arctos*. This species inhabits the forests of Eurasia, as well as North America. In the case of Bulgaria, it now appears only in the mountains, but it is characterised by its considerable geographical variability. Fossil remains are known from the Pleistocene of Europe and Asia. The dimensions and morphology of remains point to the fox *Vulpes vulpes*. This species is widespread appearing in various environments and zones of climate and vegetation. It is also common in Bulgaria. Fossils are encountered in many Pleistocene localities.
Mode of production	The technique employed to perforate these teeth was one that dominated during most of the Aurignacian. It consisted not of drilling in a rotational movement, but rather of gouging the root's surface first on one side, then on the other, until an opening appeared. There was no subsequent concern with removing the rather heavy traces left by this procedure.
Microanalysis	As above
Interpretations	Kozlowski 1982, in his final comments states, "It is worth drawing attention to the presence in layer 11 of ornaments made from perforated teeth of the bear and the fox; these are the earliest known products of this type in Europe."
Current location	?
References	Kozlowski J. 1982.

Cat 20. Pierced bear and fox teeth, Bacho Kiro

Image: White, 2003:131 (Ill. 92A)

Catalogue No.	**21a, 21b**
Site Name	Istallosko
Location of Site	Bukk Mountains, Hungary
Date of Artefact	21a) 44,300 ± 1900 BP 21b) 39,800 ± 900 BP
Object Type	21a) imitation in antler of a perforated red deer canine 21b) plate of ivory carefully perforated
Dimensions	?
Material	Cervid antler and mammoth ivory
Type of site	Cave site
Environmental conditions	No local environmental information, but an early warm period lasted until c. 45,000 BP when the climate began to deteriorate and between 42,000 – 38,000 BP cold events with very low minimum temperatures began to appear in close-spaced clusters.
Context	Level 9
Description of context	Early Aurignacian
Associated finds	Mode 4 industry - Stone artefacts, blades and burins, objects used in ornamentation and artistic elements
Date range of site	Early Aurignacian
Dating method	Radiocarbon dating
View/Perception of Object	Most likely used as objects of personal ornamentation.
Source of Raw Material	Of the 5,000 animal bones in the archaeological level at Istallosko, only five are of red deer, suggesting that the choice to represent this animal's tooth had nothing to do with its dietary importance.
Mode of production	The vestigial canine of a red deer was first sculpted in cervid antler and then perforated. The plate of mammoth ivory exhibits careful perforation.

Microanalysis	None undertaken
Interpretations	New class of objects, that of facsimiles. Little information translated into English is available for this site, yet the small amount of data we have alludes to new modes of thinking, especially the implications of the manipulation of deer antler to make it look like a deer's tooth is a form of imitation not previously seen.
Current location	?
References	Vertès, 1955; Foley & Lahr, 1997



Cat 21a. Imitation in antler of a perforated red deer canine, Istallosko

Image: Vanhaeren & d'Errico, 2005:1112 (fig.45)

Catalogue No.	**22a, 22b**
Site Name	Üçağızlı Cave
Location of Site	Located on the Mediterranean coast of the Hatay region of south-central Turkey
Date of Artefact	41,000 - 30,000 BP
Object Type	Several hundred pierced shells and a raptor talon
Dimensions	Shells range from 0.7 - 1.8 cm in length. Length of raptor talon = 3 cm
Description of object	The terminal phalanx of a large predatory bird (eagle or vulture) incised for suspension is one of the few ornamental objects not made of shell. The Palaeolithic inhabitants of Üçağızlı were selective in their choice of shells for ornament making, preferring comparatively rare varieties with luminous white or brightly coloured shells, some with arresting patterns. A variety of mollusc species were used as ornaments at both sites, but the same taxa predominates. Two species of marine gastropod, the carnivorous scavenger *Nassarius gibbosula* and the omnivore *Columbella rustica*, together account for between 50% and 90% of the total assemblage in all layers. Some of these shells were stained with red ochre.
Material	Marine and freshwater mollusc shells and terminal phalanx of a large predatory bird (eagle or vulture)
Type of site	Cave site
Environmental conditions	The cave is situated in a very steep, rugged coastal area just south of the delta of the Orontes river. The top of the archaeological deposits sits about 18 meters above present sea level. During the coldest parts of the Late Pleistocene, sea levels would have been considerably lower, and the site would have been farther from the marine shore. Because the topography around Üçagizli cave is so steep, however, the site was never very far from the sea. The early Upper Palaeolithic sequence of Üçağızlı cave falls within Marine Isotope Stage (MIS) 3, the onset of which is marked by rapid minor temperature oscillations but trends toward cooler conditions overall. Elevated frequencies of roe deer, wild pig and bear suggest heavy vegetation. A substantial degree of forest cover prevailed in the areas of the site at the time layers B-B4 were deposited. The abundance of shellfish remains also suggests that sea level was relatively high and the shoreline fairly close to the cave.

Context	The archaeological sequence has been divided into 8 layers (B- I) each of which has more subdivisions.
Description of context	The notched claw of a very large bird (vulture or eagle), was found in Layer B, F5a. Shells were found throughout layers B-I. Perforated marine mollusc shells are extremely common in layers B-B3. A large number of shells of *Theodoxus jordanii* were found in Layer C, a mollusc that prefers brackish or fresh water.
Associated finds	Terrestrial herbivores dominate the collections of animal bones from layers B-B3, including roe deer (*Capreolus capreolus*) fallow deer (*Dama mesopotamica*) and wild goat (*Capra aegegris*). Remains of larger ungulates such as red deer (*Cervus elaphus*), *Bos primegenius*, as well as bears and pigs are present in small numbers. Two varieties of marine mollusc, limpets (*Patella*) and turbans (*Monodonta*) were also consumed in large edible quantities. Terrestrial small game animals, particularly birds, are present in significant numbers. Sparse remains of large marine fish suggest that these animals were sometimes eaten as well.
Date range of site	43,000-17,000 BP
Dating method	The oldest assemblage assigned to the Initial Upper Palaeolithic refers to layers G, H and I, covering a range of radiocarbon dates from 35,100±1400 BP – 41,400±1100 BP. Layers F-F2 (Initial Upper Palaeolithic) dates between 34,000±690 – 35,020±740 BP. Layers E-E2 (Early Upper Palaeolithic) dates to 36,560±790 – 37,870±920 BP. Layer C (early Ahmarian), 29,060±330 Layers B1-3, 31,900±450 – 34,580±620 Layer B dates to 29,130±380 BP. See Table below.

Radiocarbon dates from Üçağızlı Cave
(From Kuhn *et al*. 2009:91)

Layer	ID number	14C Age	Sigma
B	AA38203	29130	380
B1–3	AA42320	31900	450
	AA38021	32670	760
	AA42317	34580	620
C	AA42321	29060	330
E	AA41482	37870	920
	AA41483	36560	790
Fb-c	AA35260	34000	690
	AA37624	35020	740
G	AA37626	39100	1500
H-H3	AA52050	35500	1200
	AA35261	35670	730
	AA27995	38900	1100
	AA27994	39400	1200
	AA37625	41400	1100
I	AA52055	35100	1400
	AA52051	39200	1300
	AA52054	39700	1600
	AA52052	40200	1300
I	AA68963	33874	271
	AA68962	36915	335
	AA68965	39817	383

Source of Raw Material The shells are usually whole, and a significant portion show evidence of abrasion by water or wave action, indicating that they were collected from beaches. Most of these shells were collected from active shorelines and rivers of the area.

Mode of production Most of the archaeological specimens were modified by humans, usually by scratching and/or punching a hole near the shell's lip with a pointed tool. These perforations are distinct from the regular, bevelled holes bored by predatory molluscs. Unworked shells, along with specimens broken during manufacture, indicate that many of the ornaments were produced on site. Only a few were worn-out and abandoned after extended use. Other shells were broken during attempts to perforate them.

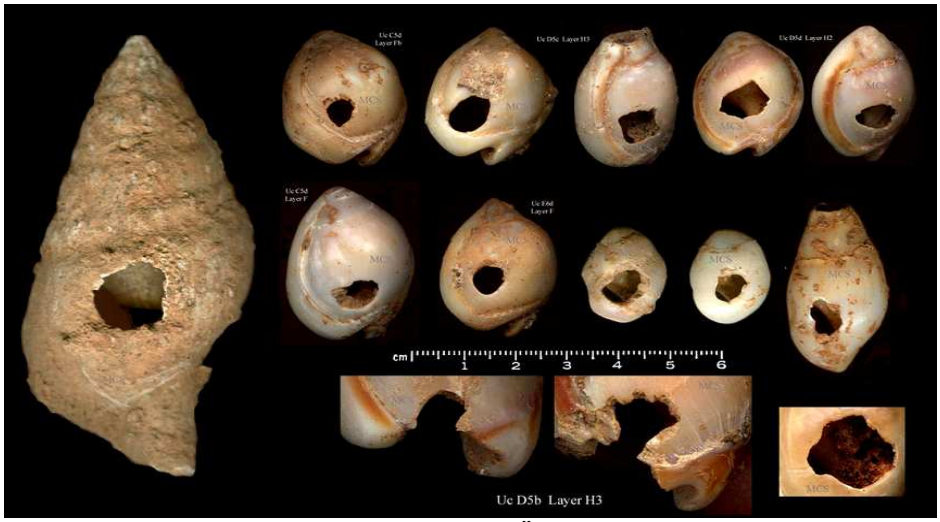
Microanalysis Less than 5% display fine polish on the edges of the hole from prolonged contact with fibre.

Interpretations Beads and pendants may have been used in the Upper Palaeolithic/Late Stone Age to communicate social

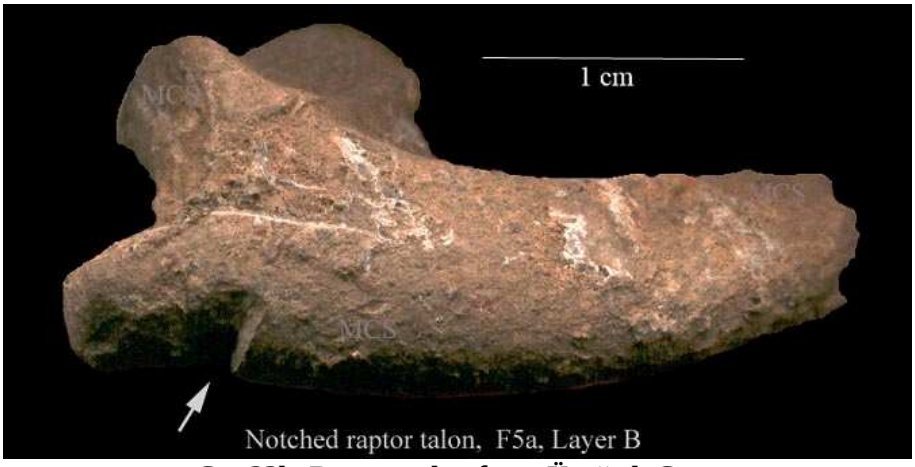
identity, such as group membership, gender, and individual life-history characteristics. In recent populations, visual display of personal information through ornaments, clothing, or other media most often targets strangers or infrequently encountered individuals. The benefits of efficient visual communication, especially at a distance, depend on the likelihood of encountering someone less familiar. As a consequence, we might expect ornament technology to arise first where the chances of meeting strangers, and the benefits of advertising one's identity and status from afar, were relatively high.

Current location University of Ankara and University of Arizona

References Stiner, 2003; Kuhn *et al.* 2003; Kuhn, Stiner & Gulec, 2004



Cat 22a. Shells from Üçağızlı Cave



Cat 22b. Raptor talon from Üçağızlı Cave

Images: University of Arizona, Üçagizli Cave website (http://web.arizona.edu/~hatayup/)

Catalogue No.
23a Fox tooth
23b Fragment of smooth Belemnite

23c Fragment of ridged Belemnite
23d Bone beads
23e Perforated shells
23f Possible human figurine

Site Name Kostenki

Location of Site Kostenki is located c.400 km south of Moscow on the west bank of the Don River, Russia.

Date of Artefact 23a – fox tooth = 32,700 (+200 -1600) BP
23b/c – Belemnite = 32,700 (+2000-1600) BP and 36,400 (+1700-1400) BP
23d/e – Bone Beads and Shells = 32,420 ± 440/420 (GrA-18053) for the 'ash horizon' of Kostenki 14
23f – Figurine = c.40,000 BP

Object Type 23a - Perforated Arctic Fox tooth
23b/c – Smooth and Ridged Belemnite
23d - Bone beads
23 e – Pierced marine shells
23 f – Carved ivory, possible unfinished human figurine

Description of object 23a – From the site of Kostenki 17 thirty-seven perforated fox canine teeth have been uncovered

23b/c - Belemnite are spectacularly beautiful in colour and translucence, and are easily mistakable for amber. Two different taxa of Belemnite are represented by two examples each. The primary difference between them is the presence on one of fine transverse ripples, which have remarkable visual and tactile effect.

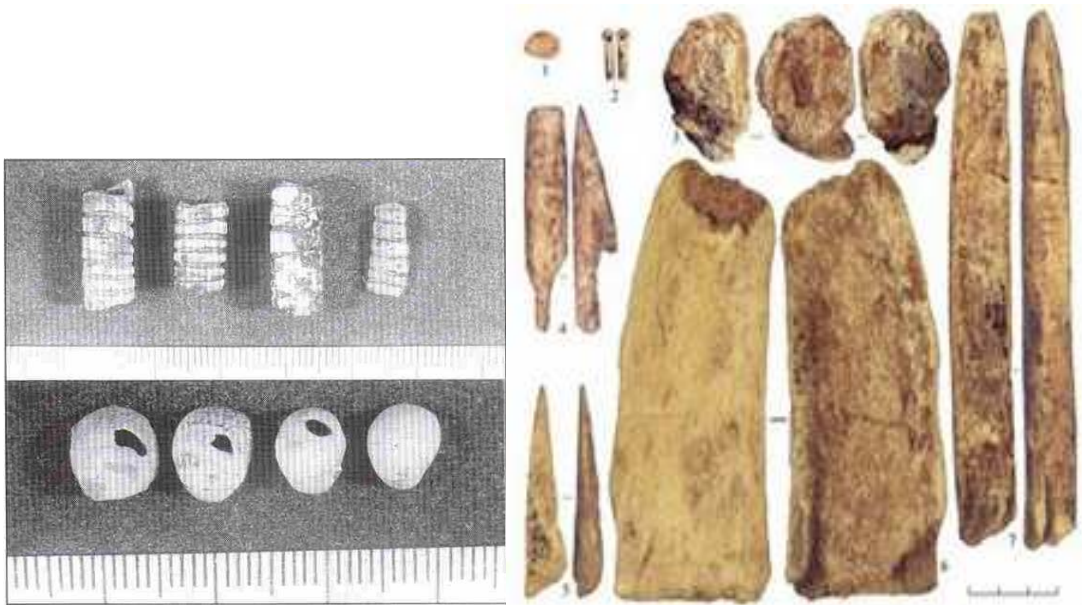
23d - Four elongated beads made out of bone from Kostenki 14, thought to be manufactured from the diaphyses of the Polar Fox's long bone and in one case from a bird bone, although not identified to genus. The beads are encircled by deeply cut lines, in one case forming a spiral pattern, and all exhibit a strongly polished surface and smooth edges, suggestive of long periods of use. The two drilled Polar Fox canines together with the bone beads and shells have been suggested as possibly forming the third component of an ornamental necklace.

23e - The shells, identified as *Theodoxus fluviatilis Neritidae* display perforations, and smoothed edges, indicating extensive use.

23f – Sculpted piece of ivory that is thought to represent

	the head of an (unfinished) human figurine, which displays little, if any, carving, or facial features.
Material	Teeth, bone, fossil, ivory
Type of site	Kostenki is not actually a single site but an area on the right bank of the Don River in the regions of the villages of Kostenki and Borshevo, consisting of more than twenty one locations, all dating to the early Upper Palaeolithic, most of them comprising several occupation levels.
Environmental conditions	Most of the Kostenki sites are found on low terraces near the mouths or the upper reaches of these ravines. Kostenki contains evidence that the people living here were broadening their diet to include small mammals and freshwater aquatic foods. Along the edge of the river was a gallery forest, and the trees would have been much smaller because of the harsher climatic conditions, equivalent to those prevailing now 10 degrees further north, at around 61° north. The river would have been smaller since there was less precipitation, and the viewpoint would have been only a few metres in altitude above the river. Springs and seeps, which are still present in the area today, emanated from the bedrock valley wall. Their presence may account for the unusually high concentration of Upper Palaeolithic sites in this part of the central East European Plain. The character of the archaeological deposit at Kostenki 14 suggests a short-lived settlement brought to an end by a catastrophic volcanic event. The thickness of the tephra late in the Kostenki area, reaching 10-15 cm (in the filling of an ancient ravine at Kostenki 6 its thickness is up to 40 cm) implies that its concentration in the atmosphere was immense.
Context	23a – Kostenki 14 – ash layer 23b/c – Upper part of humic level 12, Kostenki 17 23d/e – Kostenki 14 – ash layer 23f -Figurine = Kostenki 14, Layer IVb
Associated finds	Large animal remains at Kostenki include mammoth, woolly rhinoceros, bison, horses, moose and reindeer. Buried under 10 feet to 15 feet of silt, the artefacts at Kostenki include blades, scrapers, drills and awls, as well as sturdy antler digging tools known as mattocks that resemble crude pick-axes.
Date range of site	Radiocarbon and optically stimulated luminescence (OSL) dating and magnetic stratigraphy indicate Upper

	Palaeolithic occupation, at archaeological sites on the Don River in Russia between 45,000 to 42,000 years ago.
Dating method	Radiocarbon, OSL
Source of Raw Material	The perforated shells in the lowermost level at Kostenki 14 apparently are derived from a source no closer than the Black Sea, which indicates they were transported more than 500 km from source to the Kostenki site.
Mode of production	The final form of the four Belemnite fossil beads is the result of a production sequence that began with the natural cylindrical form of the belemnites. Subdivided into segments that were then split down the centre, each half being semi-cylindrical in section. Three of these segments were then perforated one end by means of fine, biconical rotational drilling. The fourth was drilled from the outside in, and the distal and proximal ends smoothed by polishing, as were the lateral margins.
Microanalysis	Shell, fossil, and bone ornaments were made with a hand-held rotary drill.
Interpretations	Kostenki is important for the number of Upper Palaeolithic sites concentrated in one area and for the social and economic strategies employed to live in a harsh climate. Further, a large number of cultural objects, including artistic activity have been discovered from many sites here.
Current location	Palaeolithic Institute of the Russian Academy of Sciences, St. Petersburg, Russia.
References	Borikovsky *et al.* 1982; Praslov 1985; White, 1992; Chabai, 2001; Sinitsyn, 2003; Anikovich *et al.* 2007; Hoffecker, 2007



Images:

Cat 23a. top left (White, 2003);

Cat 23b. top centre (White, 2003);

Cat 23c. top right (White, 2003)

Cat 23d/e. bottom left (Sinistsyn, 2003);

Cat 23f. bottom right (Hoffecker, 2007)

Catalogue No.	**24a, 24b**
Site Name	Abri Castanet
Location of Site	Sergeac, Dordogne region, France
Date of Artefact	Perforated shells and ivory beads from Layers I and II. Engraved ceiling = 32,400 BP for the layer onto which the ceiling fell
Object Type	Hundreds of perforated shells and engraved ceiling
Description of object	Large portion of the collapsed shelter ceiling bearing engraved and painted imagery.
Material	The beads from Castanet were made from chlorite, talc, calcite, bone, hematite and lignite.
Type of site	Rock shelter. It is one of a series of such sites that includes the Abri des Merveilles, the Abri Blanchard, and la Souquette.
Environmental conditions	Located at the bottom of a cliff by the Vézère River
Context	Layers I and II
Description of context	Original excavation by Peyrony (1935) described 2 Aurignacian levels. The first one stands on the bed-rock and shows split based points and has been attributed to the Aurignacian I. On top, was an Aurignacian II level that contained a lithic industry with blades, notches, scrapers, and burins, a poor bone industry with flattened lozenge-shaped points and awls, and engraved limestone blocks. Faunal remains were rare. Reindeer dominated, followed by horse, bovids, wolf, fox, and brown bear.
Associated finds	Abri Castanet yielded a rich sample of tools and weapons in bone and antler
Date range of site	*AMS dates from Abri Castanet.* **Lab no. — Stratigraphic layer — Date cal. BP** GifA 99165 — Stratigraphic Zone 114 — 31,430±390 GifA 99179 — Stratigraphic Zone 122 — 32,310±520 GifA 99180 — Stratigraphic Zone 122 — 32,950±520 GifA 99166 — Stratigraphic Zone 131 — 34,320±520 (From White, 2007:294, Table 24.2.)
Dating method	Radiocarbon dating

Source of Raw Material	The pierced seashells came from the Atlantic shore some 200 km distant at the time the site was occupied.
Mode of production	The five main production stages for the manufacture of Aurignacian basket-shaped beads. • Stage 1: creation of cylindrical, pencil-like rods of talc/chlorite or of ivory. • Stage 2: circumcision of these rods into segments of 1 to 2 cm long, which are then snapped off the longer rod. • Stage 3: bifacial thinning of one end of the detached cylinders to create a kind of stem at one end and a bulb at the other. • Stage 4: perforation by bifacial gouging or rotational drilling at the junction of the stem and the bulb. • Stage 5: reduction of the stage 4 roughout by coarse abrasion and eventually by fine polishing in order to obtain the characteristic basket shape.
Microanalysis	Systematic samples of raw sedimentary matrix have been analysed microscopically, resulting the recovery and identification of micro-vestiges of ornament production. These include such items as ivory shavings and talc dust from the finishing of soapstone beads by abrasion and polishing.
Interpretations	Although many Aurignacian sites contain worked bone and art objects, Abri Castanet is unique both for the number and variety of objects represented.
Current location	Musée National de Préhistoire in les Eyzies, France
References	Peyrony, 1935; White, 2007

Cat 24a. Perforated shells, Abri Castanet

Images (above): Randall White, New York University
http://www.nyu.edu/gsas/dept/anthro/programs/csho/white.html

Cat 24b. Engraved ceiling, Abri Castnet

Image: R. Bourrillon (from White, 2008)
http://anthropology.as.nyu.edu/docs/IO/7625/Anthro_Newsletter2008.pdf

Catalogue No.	**25**
Site Name	Abri de la Souquette
Location of Site	Vézère Valley, Dordogne, France
Date of Artefact	Aurignacian c. 32,000 - 34,000 BP
Object Type	Facsimiles of seashells sculpted in mammoth ivory
Dimensions	Length 2 – 2.5 cm
Description of object	The imitation in mammoth ivory of a seashell. The ivory has been sculpted in the same shape as a seashell, but also the surface exhibits the same features of real shells. These replicas are pierced for suspension, and quite interestingly, although imitating a shell in form, the position of the piercing does not replicate the same position in which a real shell would be pierced, which may simply be a pragmatic consideration. Nevertheless, these facsimiles are remarkable in their likeness to a shell, most notably in the rendering of the surface, revealing a keen eye for detail. Moreover, at only 2 – 2.5 cm in length demonstrate a technical proficiency on a small scale.
Material	Mammoth ivory
Type of site	Rockshelter
Environmental conditions	The major geographic features defining the landscape are rivers that have cut downward into the underlying limestone as they flow westward toward the coastal plain and Atlantic coast. River valleys were open areas favouring grassy steppe vegetation with some arboreal elements, particularly coniferous species on acidic plateau soils. Sheltered valleys and south-facing slopes with greater sun exposure would have supported thermophilous deciduous trees. Reindeer frequencies are highest at sites in the Dordogne and adjacent river valleys during the early Aurignacian and remain important at sites in the Vézère Valleys. Red deer, roe deer, and wild boar increase in and near the Vézère during the later Aurignacian, reflecting the increasing diversity of local environments.
Context	Aurignacian
Description of context	Earliest occupied levels of Aurignacian.

Date range of site	Aurignacian 34,000 – 28,000 BP
Dating method	No radiometric dating available
Source of Raw Material	Mammoth ivory – probably quite local.
Mode of production	Carved / sculpted
Microanalysis	None undertaken
Interpretations	New class of objects in the Aurignacian, facsimiles – The capacity to extract a form from a natural context and to transfer it to a completely new medium.
Current location	Musée de Castel-Merle, Sergeac, Les Eyzies-de-Tayac France
References	Blades, 1999a,b; White, 2003, 2007

Cat 25. Facsimiles of seashells made from mammoth ivory, Abri de la Souquette

Image: White, 2003: 70 (Ill.31)

Catalogue No.	**26a, 26b, 26c, 26d**
Site Name	Grotte d'Isturitz
Location of Site	Located in the valley of Arberoue in the *Pyrénées-Atlantiques*, in south-west France
Date of Artefact	The two layers (levels 4c6 and 4d1) from which these assemblages appear have yielded radiocarbon dates of 34,630± 560 and 36,550±610.
Object Type	a) 15 perforated shells of *Littorina obtusata* b) Calcite pendant c) Amber pendant d) Perforated human teeth
Description of object	*Littorina obtusata*, known as the common flat periwinkle is highly variable in colour (from olive green to yellow to banded and chequered patterns) depending on its habitat, and while the shell appears smooth, upon closer inspection has a finely interwoven appearance. Level 4a yielded a perforated human lower molar (left M2 or M3), punctured by back-and-forth rotation created by a rather obtuse tool point; and showing signs of heavy wear
Material	shells, calcite, amber and a human tooth
Type of site	Cave site
Environmental conditions	This immense cave is located around 10 km east of the village of Hasparren. It straddles the border between two counties in the Pyrénées Atlantiques region, Isturitz and Saint-Martin-d'Arberoue. Opening into the Arberoue Valley, the cave penetrates Gaztelu Hill, a rocky spur 500 meters long, 300 meters wide, and 100 meters high.
Context	a) perforated shells from level 4d b) pierced fragment of calcite from level 4d c) Amber pendant from level 4c overlying 4d but no date as yet d) perforated human teeth from level 4a
Description of context	Grotte d'Isturitz has revealed multiple Aurignacian stratigraphic units, beginning with Archaic Aurignacian (levels 4d and 4c) at the base and ending with Early Aurignacian (levels 4b through to 3) on top. Level 4d is bracketed top and bottom by two dates 34,630±560 (Gif-98237) and 36,550±610 (Gif-98238).

Associated finds	Current research has confirmed the presence of an exceptional industry from the earliest phases of the Aurignacian. The “Proto-Aurignacian” or “Initial Aurignacian”, as it is called at Isturitz, is known at only a few sites in France, Spain and Italy. The Proto-Aurignacian is distinguishable in the various forms of retouched bladelets. The different phases of the Aurignacian are primarily based on these small, often tiny, flint tools. In the Proto-Aurignacian at Itsuritz, these bladelets are very abundant and often long and straight in profile. In the Early Aurignacian they are less numerous and usually small and curved in profile. The two types of bladelets are made by different techniques, confirming that they correspond to different technological concepts.
Date range of site	From Mousterian (c. 50,000 BP) to end of Magdalenian (c. 10,000 BP)
Dating method	Radiocarbon dating
Source of Raw Material	The source of the amber is Cretaceous fossil-bearing deposits in the Pyrenean foothills. Human Lower left M2 or M3. Grotte d’Isturitz is about 40 km from the Atlantic Ocean, the source of the seashells.
Mode of production	Human tooth perforated by back-and-forth rotation. The hole, created by a rather obtuse tool point, is heavily ‘worn’. In spite of 20 basket-shaped beads and fragments in levels 3 and 4a (Early Aurignacian) at Isturitz, only one unfinished bead and no production debris have yet been found in the area excavated. In the small area recently excavated at Isturitz, evidence for ornament production is virtually absent, with one exception: strong traces of the working of amber ornaments on site, a phenomenon restricted in time to levels 4b and 4c.
Microanalysis	Level 4a yielded a perforated human lower molar (left M2 or M3), punctured by back-and-forth rotation created by a rather obtuse tool point; and showing signs of heavy wear
Interpretations	According to White (2007:298), the idea recently re-presented of regionally distinct configurations of personal ornaments corresponding to geographically and linguistically distinct ethnic units, does injustice to both ethnographic reality and to archaeological reconstruction. Such geographic units are not nearly as clear in the ethnographic record as one would like.
References	White, 2007a,b; 2008

Cat 26c. Amber pendant, Grotte d'Isturitz

Image: White, 2008:23

Cat 26d. Perforated human tooth, Grotte d'Isturitz

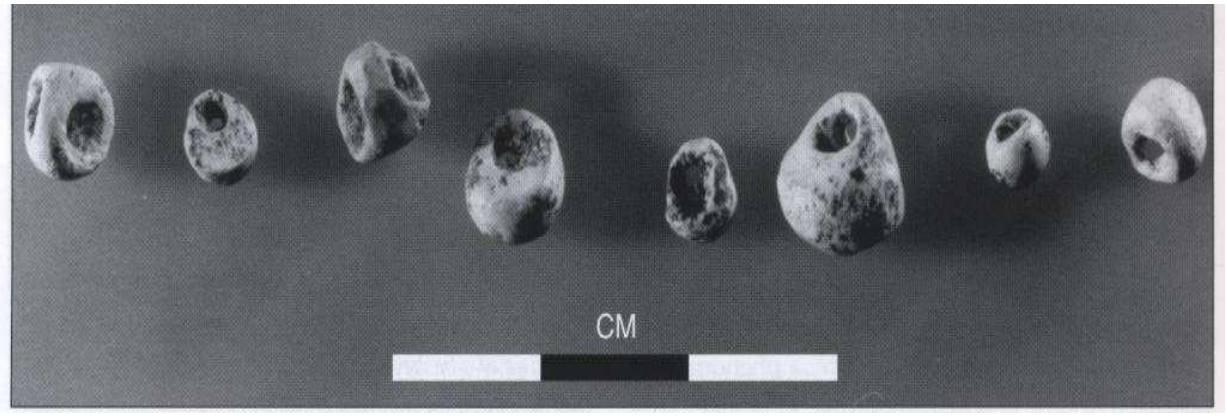
Image: White, 2007a:294 (Fig. 24.11)

Catalogue No.	**27**
Site Name	Grotte des Hyènes
Location of Site	Brassempouy, Landes, Aquitaine Basin, France
Date of Artefact	Aurignacian
Object Type	Pierced teeth (fox, wolf, deer), shells, facsimiles of cervid canines (one in ivory, the other in stone), and four perforated human teeth.
Description of object	Nearly all the personal ornaments from the Grotte des Hyènes are basket-shaped beads.
Material	The beads and pendants from ensemble 2 at the Grotte des Hyènes, Brassempouy, were made from ivory, chlorite, talc, calcite, bone, hematite and lignite.
Type of site	Cave site
Environmental conditions	The faunal remains is dominated by horses, aurochs and reindeer—mostly as food remains that often show cutmarks or charring—as well as hyenas, which probably lived in the cave when humans did not. Wolves make up less than 3% of the total fauna.
Context	See Stratigraphic layers below
Description of context	Upper Aurignacian levels
Associated finds	Aurignacian lithic technology

Date range of site

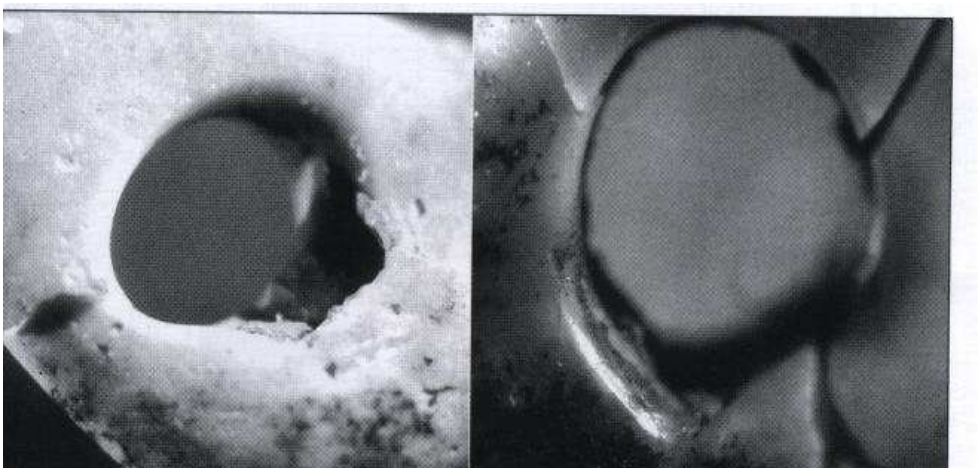
Lab No.	**Stratigraphic Layer**	**Date cal. BP**
GifA-9658	Ens.1(end of Aurignacian sequence)	30,600±200
GifA-8174	Couche 2A-2C	32,190±620
GifA-8568	Couche 2A-2C	31,820±550
GifA-8569	Couche 2A-2C	31,690±780
GifA-9031	Couche 2D/2F	30,100±400
GifA-8570	Couche 2E	17,970±150
GifA-9032	Couche 2E	26,870±500
Gif/LSM-11035	Couche 2E	31,960±160
GifA-98105	Couche 2DE	32,410±370
Gif/LS P. Broskerb M-11304	Couche 2DE	33,600±240

	Radiocarbon dates for the Aurignacian sequence at the Grotte des Hyènes. From White, 2007:289 The dated archaeological levels indicated above extend over varying surface areas, with the total area excavated being roughly 25m².
Dating method	Radiocarbon dating
Source of Raw Material	Brassempouy's location some 250 km closer to the Pyrenean talc sources results in much higher percentages of talc beads.
Mode of production	Four techniques are present in the Grotte des Hyènes, ensemble 2 sample with respect to the modification of objects for suspension: Perforation by bifacial gouging; Perforation by demi-rotation; Perforation by pressure or indirect percussion; Perforation by basal circumcision (Rainurage).The four human teeth were prepared by perforation or rainurage (basal circumcising). A small amount of fabrication debris and some unfinished beads and pierced teeth indicate on-site manufacture of at least some of the basket-shaped beads and pierced teeth at both Castanet and Brassempouy
Microanalysis	A wolf canine shows distinct stigmata (hacking, scraping, gouging) of preparation for perforation. The fact that this object was abandoned or lost before perforation occurred implies on-site production of at least some tooth-ornaments.
Interpretations	Personal ornamentation seems one of the key means by which Aurignacian regional groups constructed and communicated intra-group and regional identities. On a finer chronological scale, we can now see that within a single Early Aurignacian sequence such as the Grotte des Hyènes at Brassempouy, raw frequencies of tooth ornaments as well as species proportions vary through time. The animals whose teeth are worn are not those whose meat is consumed. Phrased another way, the consumed fauna and the displayed fauna are almost mutually exclusive. This implies that the animals behind the parts transformed into ornaments are construed in terms that are largely of the collective symbolic imagination.
Current location	?
References	Henry-Gambier *et al*. 2004; Henry-Gambier & White, 2006; White, 2007a,b



Cat 27. Eight of the ivory basket-shaped beads from the Grotte des Hyènes, Brassempouy

Image: White, 2007:296



Cat 27. Two examples of fox canines perforated by pressure or indirect percussion. The attack point in both vases is clearly evident at the hole margin

Image: White, 2007:291

Catalogue No.	**28a**
Site Name	Grotte de Chauvet
Location of Site	Vallon Pont d'Arc, Ardèche, France
Date of Artefact	30,340 ± 570 BP (Gifa 95128) Dating sample taken from central bison
Object Type	Wall painting termed ‘The Bison Panel’
Dimensions	The Bison Panel decorates part of an enormous descending rock 3 to 4 metres (9¾ to 13 feet) wide.
Description of object	In the End Chamber, a pillar facing the entrance is decorated with a black bison. It is a vast panel covered in claw marks and with areas of corrosion that predate the drawings. Apart from three big bison, it comprises the cervico-dorsal line of an isolated mammoth, engraved at arm's length. Among various lines, engravings and scrapings, three horse heads can be made out. A fossil present in the wall was used for the eye of one of them. These animals were engraved before the black drawings, which also comprise a big black feline facing left, earlier than the big bison.
Material	Black charcoal
Type of site	Cave site, not inhabited by humans.
Environmental conditions	The Pont d’Arc dominates the entrance to the Ardéche gorges. This geological phenomenon is unique and comprises a natural arch under which a permanent river flows. This arch was created by the waters, which after meandering through the limestone mass (the Cirque d'Estre) cut through its rocky stem underground. Chauvet cave is located in the cliffs of the Cirque d'Estre, and research indicates that the Pont d'Arc already existed in the Upper Palaeolithic, and that people must regularly have seen the meander of the Cirque d'Estre invaded by the Ardèche floods. The first analyses carried out on the floors of Chauvet bearing marks of incursions have show that the environment was a cold and relatively dry steppe, with graminae, artemisia, goosefoot, bedstraw, and helianthemums. This landscape however contained a number of trees, such as the juniper, birch and Scots Pine, which must have been confined to protected spots located close to the cave.

Context	The location of the Bison Panel occurs to the right of the left wall of the End Chamber known as the Big Panel
Description of context	The entrance to the End Chamber is about 5m wide and is marked by a major drop in floor level, where a succession of irregular terraces have formed, some of which exhibit enormous hollows created by bears. This area comprises three main parts, where ceiling heights range from 5 and 6 metres to 12 metres in height. The End Chamber also contains other imagery such as the Panel of the Big Lions, Panel of the Rhinoceroses, Lion and Bison Panels. This section dominates the lowest point of the cave - going down 23 metres (75 feet), covered with clay bearing the prints of bears and ibex.
Associated finds	The location of the Bison panel occurs to the right of the left wall of the End Chamber known as the Big Panel. This is one of the most iconic panels in Chauvet because of its depictions of animals, almost procession-like, facing for the most part, in the same direction, and portrayed as if moving over the recess in the wall. Between the Bison Panel and Big Panel sits the so-called Sorcerer pendant, a protrusion of rock that descends vertically to end in a point 1.2 metres from the floor. The panel has four faces, one is marked with red colouring, and one showing the so-called Sorcerer, comprising the forequarters of a bison on top of, what has been interpreted as, human legs. What is striking is that the animals depicted on the Bison Panel, the Sorcerer pendant and Big Panel all face in the same direction. A fire was made in front of the so-called Sorcerer pendant, and perfectly preserved fragments of charcoal are scattered all over the floor; a heap of charcoal can be seen in a small recess of the Big Panel
Date range of site	32,000 - 20,000 BP
Dating method	The Gifa dates were obtained using accelerator mass spectrometry at the Laboratoire des sciences du climat et de l'environment (Gif-sur-Yvette, France).
View/Perception of Object	The Bison Panel can be seen very clearly on entering the End Chamber.
Source of Raw Material	In the End Chamber some pieces of charcoal are scattered on the floor; at the foot of the wall of the Panel of the Big Lions, in a small recess, a heap of charcoal can be seen although there was no hearth in this spot. As studies proceed it will be necessary to find out if the charcoal is only of vegetal origin, it is possible that the artists occasionally resorted to burnt bone.

Mode of production	A range of graphic techniques were used. Generally, two types of procedure can be distinguished; one consists of removing material from the rocky support by engraving and scraping; the other involved applying pigment by direct contact with the wall .The pigments used in Chauvet are black charcoal and red ochre, which would have been ground down to make a powder and on occasion mixed with a binder. Sometimes the pigment was applied with fingers, whole hands or in some cases, the imprint of plant fibres remain visible and animal hairs that are sticky with coloured paste lie close by.
Interpretations	The End Chamber's major characteristic is the way in which it has been thought out and constructed. In the first part, on the left, the big felines, in two groups of comparable importance, separated by an empty space of several metres, seem to face each other. The Big Panel is organised in a symmetrical way on both sides of the central niche, each lateral section displaying two parts determined by reliefs in the wall, with distinct subjects. The wall of the big black bison figures faces the arriving visitor, as does the Sorcerer pendant.
Current location	In situ
References	Clottes, 2003

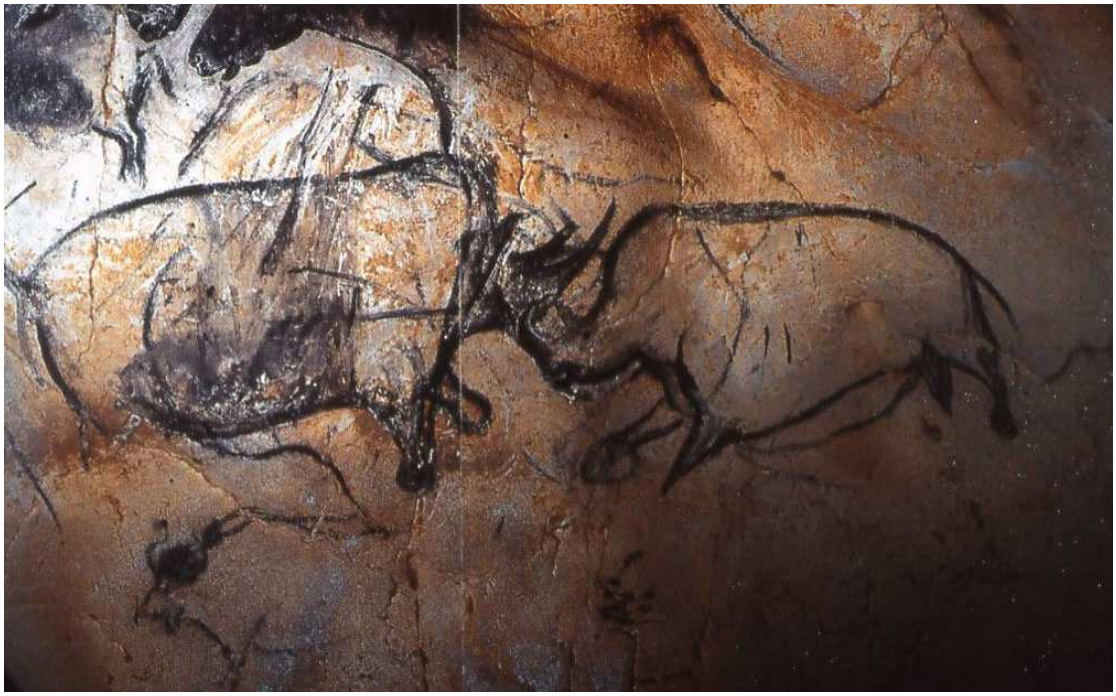
Cat 28a. The 'Bison Panel', Chauvet Cave

Image: Bradshaw Foundation
http://www.bradshawfoundation.com/chauvet/2nd-visit14.ph

Catalogue No.	**28b**
Site Name	Grotte de Chauvet
Location of Site	Vallon Pont d'Arc, Ardèche, France
Date of Artefact	Panel of Horses Gifa 95126 = confronted rhinoceros (left) = 30,940 ± 610 Gifa 95132 = confronted rhinoceros (right) 32,410 ± 720 Gifa 95133 = confronted rhinoceros right 30,790 ± 600 Gifa 96065 = running cow 30,230 ± 530 BP
Object Type	Image of confronted rhinoceros on the Panel of Horses
Dimensions	The rhinoceros' are located on the lower part of the panel, 0.60 meters from the floor. The rhinoceros on the right is 0.72 m long and 0.44 m tall at its withers. The rhinoceros on the left is 1m in length and a height of 0.5 m, and is the largest complete figure of the panel. The panel is about 4 square metres.
Description of object	The image depicts two rhinoceroses facing each other; it is unclear whether the rhinoceroses are two males confronting each other or the prelude to a pairing between male and female; both types of behaviour exist in present-day rhinoceroses. The rhinoceros on the left is positioned on a portion of wall that is flat, while the hindquarters and limbs of the rhinoceros on the right are drawn on what is termed a "cradle-shaped" section of wall. The right hand rhinoceros is almost identical to the left except that it is a much clearer depiction, and does not show any blurring of lines in the same way as the animal on the left
Material	Charcoal
Type of site	Cave site, not inhabited by humans
Environmental conditions	The Pont d'Arc dominates the entrance to the Ardéche gorges. This geological phenomenon is unique and comprises a natural arch under which a permanent river flows. This arch was created by the waters, which after meandering through the limestone mass (the Cirque d'Estre) cut through its rocky stem underground. Chauvet cave is located in the cliffs of the Cirque d'Estre, and research indicates that the Pont d'Arc already existed in the Upper Palaeolithic, and that people must regularly have seen the meander of the Cirque d'Estre invaded by the Ardéche floods. The first analyses carried out on the floors of Chauvet bearing marks of incursions have show that the

	environment was a cold and relatively dry steppe, with *graminae*, *artemisia*, goosefoot, bedstraw, and *helianthemums*. This landscape however contained a number of trees, such as the juniper, birch and Scots Pine, which must have been confined to protected spots located close to the cave.
Context	The Panel of the Horses is located in the Hillaire Chamber. The Hillaire Chamber measures about 30 metres in diameter (100 feet) with a ceiling height of up to 17 metres. Three chambers and galleries converge here, the Candle Gallery, the Skull Chamber and the Megaloceros Gallery.
Description of context	The Horse Panel comprises The Horse Sector, a triptych which unfolds over about 15 m. The three panels can be divided into The Alcove of the Lions, to the right of which is the Reindeer Panel and to the left is the Horse Panel.
Associated finds	The Alcove of the Lions and the Reindeer Panel. Humans left some trace of their visits here, especially near the entrance, such as wood charcoal, a block brought to serve as a step and others piled up further on.
Date range of site	32,000 - 20,000 BP
Dating method	The Gifa dates were obtained using accelerator mass spectometry at the Laboratoire des sciences du climat et de l'environment (Gif-sur-Yvette, France).
View/Perception of Object	The Horse Sector is located more than 190 metres from the present entrance and is situated within the field of vision of any visitor moving towards the back of the cave, whether towards the End Chamber or the Gallery of the Crosshatching. The drawings stand out from the light rock background and are visible from a distance of more than 30m (99 feet).
Source of Raw Material	Charcoal
Mode of production	It is likely, in comparison to nearby panels, that before any human intervention occurred a fine film of yellow clay, probably scored by bear claw marks, overlay the original limestone surface of the wall. The next phase of this panel is the vigorous scraping of the wall, eliminating initial traces of engravings and claw marks. The third phase corresponds to the production of the fighting rhinoceroses in the lower part of the panel. The panel’s fourth chronological stage corresponds to the drawing of the aurochs in the upper left corner.

Microanalysis	Microscopic analysis (maximum 100x) has permitted several observations. The schema of construction began with the horns and the head and continued with the line of the contours. The details were then added. Highly visible striations in the line of the small red rhinoceros indicate that a particularly dense colouring material has been applied using a tool, pastel or brush.
Interpretations	Clottes suggests the conflict between the two rhinoceroses depicts a narrative scene, rarely seen in Palaeolithic art. Described by the researchers as a "masterly composition, a work of art produced not only inspiration but also experience.
Current location	In situ
References	Balter, 2008; Clottes, 2003



Cat 28b. Confronted rhinoceroses from Panel of the Horses, Chauvet Cave

Image: Jean Clottes, 2003

Catalogue No.	**28c**
Site Name	Grotte de Chauvet
Location of Site	Vallon Pont d'Arc, Ardèche, France
Date of Artefact	Megaloceros (gallery entrance) 31,350 ± 620 BP (Gifa 96063)
Object Type	Megaloceros drawing
Dimensions	About 50 cm (nearly 20 inches) long
Description of object	In the central part of the right-hand panel is a very graphic Megaloceros. Anatomically it conforms to other known megaloceros images: small head, supple neck, short tail and legs, represented with one pair that are relatively spindly in relation to the body. The withers are shown distinctly and are further emphasised by the line, stumped towards the top, which evokes a tousled coat. Although this animal had impressive antlers they are not depicted and only some short excrescences grow from the top of the head. A crescent shaped line surrounds the groin region, while the body has a broad slightly curving line running across from the dorsal hump. Above the rump of the megaloceros, an incomplete rhinoceros, limited to the horns, forehead, and cervico-dorsal line was drawn vertically, with its head facing upwards, on the left of the panel.
Material	Charcoal - the crushed pigment is mixed with the limestone and forms flat tints shading into grey.
Type of site	Cave site, not inhabited by humans
Environmental conditions	The Pont d'Arc dominates the entrance to the Ardéche gorges. This geological phenomenon is unique and comprises a natural arch under which a permanent river flows. This arch was created by the waters, which after meandering through the Cirque d'Estre, cut through its rocky stem underground. Research indicates that the Pont d'Arc already existed in the Upper Palaeolithic, and that people must regularly have seen the meander of the Cirque d'Estre invaded by the Ardèche floods. The first analyses carried out on the floors of Chauvet bearing marks of incursions have show that the environment was a cold and relatively dry steppe, with *graminae*, *artemisia*, goosefoot, bedstraw, and *helianthemums*. This landscape however contained a number of trees, such as the juniper, birch and Scots Pine, which must have been confined to protected spots located close to the cave.

Context	Located in the Megaloceros Gallery which leads on from the Hillaire Chamber and to the End Chamber.
Description of context	The walls of this gallery are very convoluted and large surfaces were left undecorated. The path through it follows three successive levels. At each point of difficulty, we can see torch marks, which are all are oriented toward the back of the gallery. Three graphic collections can be distinguished, at the entrance, middle and end of the corridor.
Associated finds	This gallery is the only place in the cave where traces of humans are found on the floor, which are well preserved are strongly linked to and directly related to the parietal art. An alignment of hearths blackened or dirtied the walls in different parts of the corridor.
Date range of site	32,000 - 20,000 BP
Dating method	The Gifa dates were obtained using accelerator mass spectometry at the Laboratoire des sciences du climat et de l'environment (Gif-sur-Yvette, France)
View/Perception of Object	The Megaloceros Panel is one of two decorated panels that face each other at the entrance to this gallery. The megaloceros is on the right and on the left the forequarters and the cervico-dorsal line of two mammoths.
Source of Raw Material	At the last level of the terrace in the Gallery evidence of hearths were probably used for producing charcoal, the raw material for the frescoes. Heaps of large pieces of wood charcoal located in alcoves along the walls directly below the paintings seem to be reserves of this material.
Mode of production	The Megaloceros is drawn in charcoal. It faces right, in an oblique position. The lines of the silhouette are sometimes doubled and relatively broad, though they become finer at the ends.
Microanalysis	The vertical rhinoceros outline engraved above the rump of Megaloceros was drawn with a piece of charcoal and the wood left its imprint.
Interpretations	The constant symmetry in the organisation and the layout of the figures, which can even be seen in the charcoal marks, makes this one of the most original spaces of the cave, a topographically strong place, as it forms the junction between the two most spectacular compositions and the site of intensive activities as revealed by the remains abandoned on the floor.

Current location In situ.

References Clottes, 2003

Cat 28c. Megaloceros drawing, Chauvet Cave

Image: Clottes, 2003

Catalogue No.	**29a, 29b, 29c, 29d, 29e**
Site Name	Fumane Cave
Location of Site	Lessini Mountains, Venetian Pre-Alps. Near Verona, northern Italy
Date of Artefact	32,000-36,500 BP
Object Type	Tablets of stone depicting representations of animals and other imagery
Dimensions	Fragment 29a = 30 x 10 x 7cm. Fragment 29b maximum dimensions: 24 x 11 x 8 cm – with anthropomorphic figure. (after restoration) Fragment 29c has maximum dimensions of 20 cm x 17 cm x 12 cm Fragment 29d has dimensions of 14 cm x 7 cm x 5 cm Fragment 29e is 35 cm x 20 cm x 8 cm
Description of object	Cat Ref 29a This stone is 30 cm long and has a convex face on which is painted a quadruped in red ochre. The image has been described as, “the profile of a four-legged animal, without a tail, with a slender body, a long neck and a relatively small (but incomplete) head. Two rear legs and one front leg are visible, but a detached flake seems to have amputated the area where the fourth leg should have been”. The image available however, does look as if the animal has a tail that stretches out behind. The body and neck appear quite long, and the neck appears quite wide. The head looks in proportion to the body, but any facial features or species characteristics are absent. Cat Ref 29b After cleaning the layer of calcite, which completely covered its face, this fragment shows the front view of an erect bipedal form. The axis of the body is painted along the length of a small ridge, and the 18 cm high figure is thought to display, “two horns on its head (or a mask?)”. However, this is such an ambiguous figure that the motif on the top of the head is highly questionable. Under the neck, the arms are spread out and the right hand holds an object hanging downwards, interpreted as “a ritual object?” Whatever its function, the object looks like a small four-legged animal being held by the ears or head. On each side of the torso, at the level of the navel there are two small lateral non-symmetrical reliefs. The lower part of the body is enlarged, perhaps relating to the stomach, to which

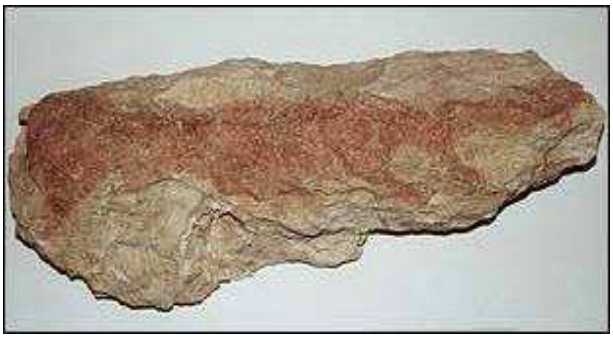
	are attached short bowed legs. Due to the flaking of the stone, the image is interrupted along the length of the right side of the body. Four other fragments (Cat. 29 c,d,e), for which three images are available here show figures, or parts of figures, which are difficult to interpret. Fragment 29c, found in Square 51/61, section D3, has maximum dimensions of 20 cm x 17 cm x 12 cm and depicts an unidentifiable quadruped; 29d is from Square 107e, section D1d, with dimensions of 14 cm x 7 cm x 5 cm showing an image that is difficult to interpret. The last fragment here, 29e found in Square 117c + f, section D3a + b is 35 cm x 20 cm x 8 cm displays some form of ring motif. The majority of these images appear incomplete, as the painting seems to continue beyond the point where the rock broke.
Material	Cave wall
Type of site	Archaeological evidence indicates that Fumane cave was a habitation site for the Aurignacian people of the Lessini Mountains, demonstrated by well-defined hearths, post-holes, piles of waste and concentrations of ochre in the sediment, distributed between the central and frontal areas of the cave. In the central area, around 150 cm under the ceiling, is the oldest hearth, while in the area in front of the entrance, there is a larger hearth, surrounded by horizontal slabs, with four post-holes nearby, interpreted as a structure protected by an artificial shelter backed onto the rock wall.
Environmental conditions	During the Würmian interpleniglacial, the western part of the Lessini mountains offered Palaeolithic hunters a huge range of resources; game on the high plateau included species from the alpine prairie and rocky environments (ibex, chamois, bison/aurochs, alpine hare, dormouse, alpine chough). In the underlying woods, red and roe deer, megaloceros deer, mountain pheasant, and thrush; and in the wet environment of the high plateau, ducks.
Context	Fragment A discovered at the base of Section D3, in contact with Section A2, under the entry porch of the cave. Fragment B In Sections A2, D5 and D3 (Aurignacian deposit) were found several rock fragments painted in red ochre. Another painted fragment also comes from the underlying Section D1d (Gravettian)
Description of context	The ongoing systematic excavations (started in 1988) have brought to light a complete stratigraphic sequence, some

	ten metres thick. The slabs on which the drawings were found had fallen from the cave roof and become embedded in the floor. The deposit has four major glaciation lithic and stratigraphic sections. The two upper ones (A and D) are made up of a sequence including Mousterian (A13- A4), Aurignacian (A3-A1, D6-D3) and Gravettian (D1d) levels. The abrupt appearance of the Aurignacian, marks a clear break with the underlying Mousterian, and corresponds to the end of a relatively temperate climatic phase. From the archaeological viewpoint, the two sequences differ in habitat structures, hunting strategies and industries. Worked animal material, ornamental objects and artistic production are only present in the Aurignacian levels.
Associated finds	The Aurignacian deposit has provided a considerable number of ornamental objects: four red deer incisors with a groove at the root level and 723 sea shells from 58 varieties, gathered on the Mediterranean coast and brought to the site. A preferential selection of the smallest, very visibly decorated, forms seems to have been made. Among the shells, nearly half have at least one drill hole made by marine predators or humans. Alongside these ornamental objects a rib from a small herbivore was found, decorated with two series of finely incised transversal lines
Date range of site	Mousterian occupation of the cave ranging between 42,000 - 34,000 BP, with the Aurignacian occupation spanning a minimum of 34,000 - 32,000 BP.
Dating method	Radiocarbon dates taken from charred wood in the Aurignacian layers range from 30,650±250 (OxA-11347) to 36,500±600 (UtC-2048).OxA refers to the Oxford Radiocarbon Accelerator Unit and UtC is the laboratory code for Utrecht van der Graaf Laboratorium
View/Perception of Object	The fragments seem to have been part of a larger wall painting that has flaked off, rather than individual representations.
Source of Raw Material	From the cave walls.
Mode of production	Painted in ochre
Microanalysis	
Interpretations	The “primitiveness” of the Fumane imagery and the “maturity” of the Chauvet cave art could be explained either by different time spans, cultural differences or functional diversity. Chauvet cave was used as an initiation and ceremonial site where there probably occurred repeated reunions of several groups of Aurignacian hunters who

shared the same cultural tradition. The quality of the art presupposes the organisation of men and means and the presence of "qualified" artists. The paintings of Fumane, however, probably more functional and linked to the habitation site that underlay them, demanded a much more modest investment.

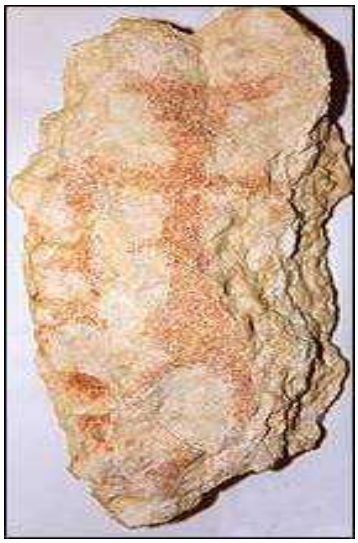
Current location Museo Civico di Storia Naturale, Verona

References Broglio, 2001; Broglo *et al*. 2001, 2003, 2006; Broglio & Gurioli, 2004; Broglio & Dalmeru, 2005



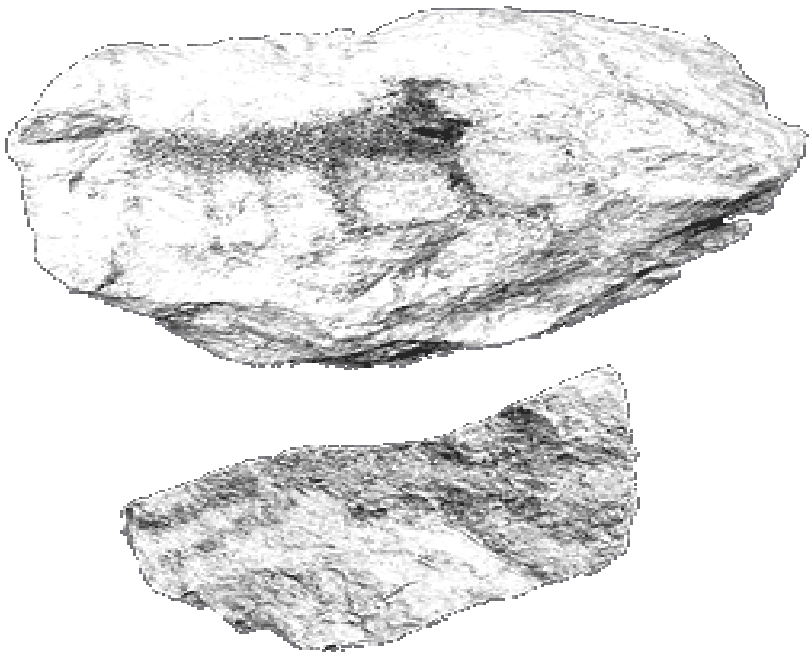
Cat. 29a. Painted rock fragment, Fumane Cave

Image: Alberto Broglio
news.bbc.co.uk/2/hi/science/nature/1000653.stm



Cat. 29b, Painted rock fragment, Fumane Cave

Image: Alberto Broglio
news.bbc.co.uk/2/hi/science/nature/1000653.stm



Cat. 29c (above) and 29d (below) Painted rock fragments, Fumane Cave

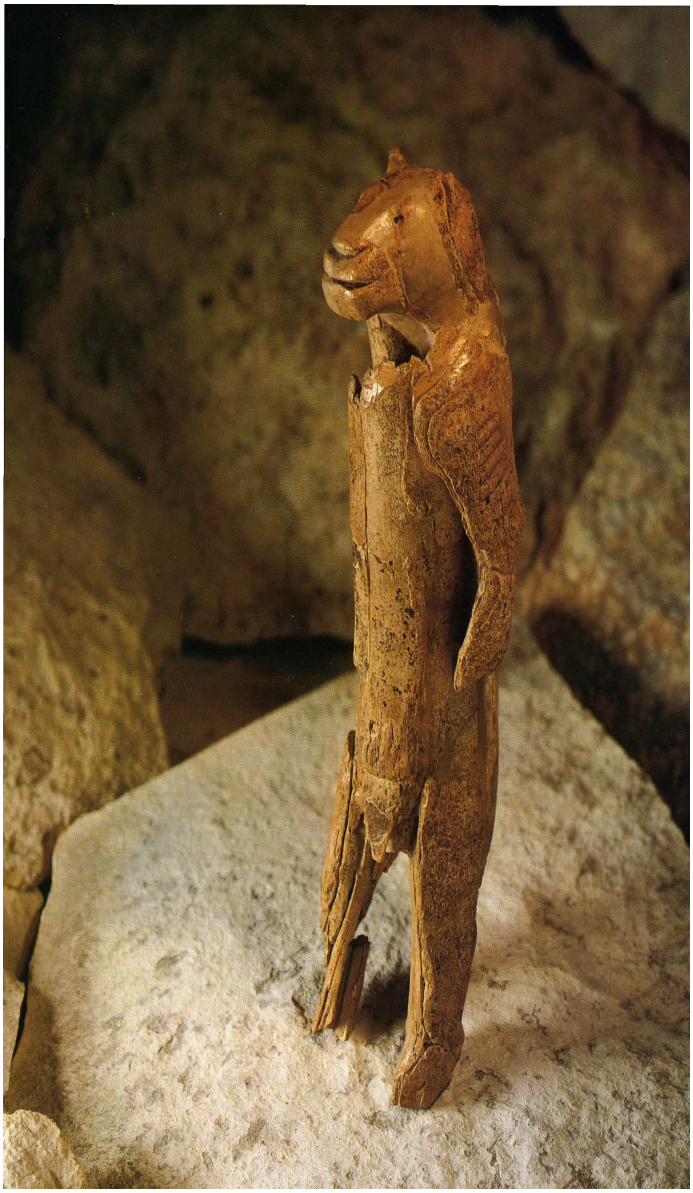
Image: Alberto Broglio
http://www.bradshawfoundation.com/inora/discoveries_44_1.html

Cat. 29e. Painted rock fragment, Fumane Cave

Image: Alberto Broglio
http://www.bradshawfoundation.com/inora/discoveries_44_1.html

Catalogue No.	**30**
Site Name	Höhlenstein-Stadel
Location of Site	N 48° 32' 57.57" and E 10° 10' 20.75" in the Hohlenstein cliff at the southern rim of the Lonetal (Lone valley) in Swabian Alb, Germany. The Danube River Valley lies several kilometres to the south.
Date of Artefact	Radiocarbon dates from 20m, spit 6 = H 3800-3025 – mixed bone sample, 31,750+1150/-650 ETH-2877 – reindeer ulna and wolf astagalus, 32,000±550 KIA 13077 – reindeer radius, 32,270+270/-260
Object Type	Ivory figurine The figurine has been termed the 'Lion-Man' or *Löwenmensch*
Dimensions	Height: 28.1 cm Width: 6.3 cm Thickness: 5.9 cm
Description of object	The reconstructed figure displays the head of a lion, the facial features of which clearly exhibit eyes, a nose and a squarely defined jaw line, with incised mouth. Small ears sit alert on top of the head, and in the anatomically correct position for a lion. The torso is elongated and smooth with no morphological features evident. Only one of the legs is complete, but they both appear quite muscular; however, they are not designed for the figurine to stand upright independently. The arms hang down by the sides, showing muscular shoulders, with seven parallel, horizontal lines incised on the upper left arm.
Material	Mammoth ivory
Type of site	Cave site. Actually, Hohlenstein-Stadel consists of three prehistoric cave sites in a group: the Stadel proper, the Kleine Scheuer and the Bärenhöhle. The cave runs 50m in length with an 8 m-wide entrance.
Environmental conditions	The Swabian Jura is a plateau in the German state of Baden-Württemberg in southwest Germany. The most prominent topographic feature is the low Jurassic-aged, limestone mountains and plateaus referred to in German as the Schwäbische Alb. The Swabian Jura ranges in elevation from about 450 to 1000 meters and is characterised today by a relatively cool and wet climate.

Context	20 m, spit 6.
Description of context	The figurine was found at the back of the cave
Associated finds	Neanderthal remains have been found at Hohlenstein-Stadel (Wetzel, 1961), and is the only cave site in Baden-Württemberg where fossil remains provide evidence for the presence of Neanderthals. The stratigraphy associated with the Aurignacian archaeological contexts is associated with modern *Homo sapiens*. Other finds consist of blades and scrapers.
Date range of site	Neanderthal remains at the site suggest occupation prior to c. 40,000 BP, but the timing of this occupation is unclear.
Dating method	Radiocarbon dating
View/Perception of Object	3D – portable object
Source of Raw Material	Unknown but probably locally sourced
Mode of production	Splitting and wedging of desiccated mammoth ivory was followed by scraping, gouging, incising, grinding and polishing. The polishing was achieved with powdered hematite, a very effective metallic abrasive, still used today by contemporary carvers. Originally found in more than 200 pieces, the figure was carefully reconstructed in 1969, 30 years after its excavation by Professor Joachim Hahn from the University of Tübingen. At the end of the 1970s, parts of the animal head turned up unexpectedly and fitted on top of the statuette. This is the largest of all Ice Age statuettes found in the area.
Interpretations	Its significance is obscure as that of the 'Adorant' from the Geissenklösterle cave. The sculpture has a lion's head, while the body is a combination of human and animal aspects - a hybrid. It could be a shaman with a lion mask. The sex of the figure cannot exactly be determined, but it is generally regarded as a male. However, the Lion-Man certainly had a profound implication that may lie in a general association with stories, rituals and related cultural settings, which remain a mystery to us to this day.
Current location	Ulmer Museum, Ulm, Germany
References	Volzing 1938; Wetzel, 1961; Conard & Bolus, 2003;



Cat 30. So-called ‘Lion-Man’ figurine, Höhlenstein-Stadel

Image: Thomas Stephan, Ulmer Museum, Ulm

Catalogue No.	**31a**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	30,000-36,000 BP
Object Type	Figurine of horse
Dimensions	Length: 4.8 cm Height: 2.5 cm Width: 0.7 cm
Description of object	It exhibits a remarkably high, arched and quite thick set neck with a long downward-looking face; although difficult to detect, it may show evidence of a forelock. The ears, mouth and nostrils and eyes are visible. The body of the horse is well-defined showing a curvilinear back and low belly. Due to the flaking of external ivory layers, the width has been reduced and the legs have broken off just above the knee. Engraved cross marks and angular signs are visible on the back of the neck, as well as on the back and the left chest. The figurine shows evidence of a small tail, which may have broken off.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – Portable object
Source of Raw Material	Unknown, probably locally sourced.
Mode of production	Using only Aurignacian tools and techniques, it took the late German archaeologist Joachim Hahn twenty-seven hours to reproduce experimentally the small ivory horse from Vogelherd.
Microanalysis	?
Interpretations	Due to the curved neck, it is usually thought to represent a stallion with an aggressive or imposing bearing. There are engraved symbols, including cross marks and angular signs, on the back of the neck, as well as on the back and the left chest.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1934; Hahn, 1987, 1993; Niven, 2001, 2007; Burkett and Floss, 2005; Hardey *et al.* 2008

Cat 31a. Ivory figurine of horse, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31b**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	30,000 – 36,000 BP
Object Type	Figurine of mammoth
Dimensions	Length: 5.0 cm Height: 3.1 cm Width: 2.2 cm
Description of object	The trunk was broken from the sculpture while it was still in use and before it became interred, and the legs are missing. The figurine has been interpreted as a male mammoth because of the carving of its bulky head. The fore and hind extremities are perforated. The mammoth shows numerous notched cross marks along the top of the back, the underbelly, and a series of five vertical cross marks from the centre of the top of the back to the underbelly. In addition, the figurine is described as exhibiting lines of dots and notches, although this is not evident from the image. In profile, the torso appears very realistically rendered.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – Portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	The fore and hind extremities are perforated. These perforations are not polished, so it may be that the figure was not worn as a pendant, but instead was sewn to a garment.
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Museum Schloss, Tubingen, Germany
References	Riek 1934

Cat 31b. Figurine of mammoth, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31c**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	30,000 – 36,000 BP
Object Type	Mammoth bas-relief
Dimensions	Length 6.9 cm Height: 2.9 cm Width: 3.6 cm
Description of object	Its surface is roughly sketched with the bas-relief of a mammoth, which displays three diagonal notches. The perforation broke while the pendant was still in use. On the reverse side, there are red/yellow coloured traces of ochre (ferric oxide).
Material	This is a unique find, since the carving is made of bone.
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.
Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes

	of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS
View/Perception of Object	3D – Portable object
Source of Raw Material	Pelvic bone of a large animal

Mode of production	Carved
Microanalysis	The perforation broke while the pendant was still in use as a necklace. On the reverse side, there are red-yellow coloured traces of red ochre (ferric oxide).
Interpretations	Interpreted as an amulet.
Current location	Museum Schloss, Tubingen, Germany
References	Riek 1931

Cat 31c. Mammoth bas-relief, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31d**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	31,000 – 36,000 BP
Object Type	Hindquarters of a mammoth
Dimensions	Length: 2 cm Height: 5.15 cm Width: 3.6 cm The reconstruction of this sculpture gives an original length of approx. 10 cm and a height of approx. 7.5 cm in which case it would be the largest sculpture from the Vogelherd.
Description of object	The figurine shows only the tail end and hind legs of an animal, and is interpreted as representing a mammoth due to the physiognomy of the back and the legs; the remains were broken off while it was still use. Rows of notches and cross-marks are engraved on the oval soles of the sculpture's feet, and horizontal lines are incised on the legs.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3-D portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Due to the form of the back and the legs, this sculpture is interpreted as representing a mammoth.
Current location	Museum Schloss, Tubingen, Germany
References	Riek 1931

Cat 31d. Hindquarters of a mammoth, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31e**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	~30-32,000 BP
Object Type	Bison
Dimensions	Length: 7.2 cm Height: 5.25 cm Width: 1.35 cm
Description of object	Only the right half of the body of first sculpture remains, and the entire head is missing The sculpture is remarkably rotund, but in profile is quite distinctively bison-like, notably due to the hump on the shoulders, and the apparent mane depicted by cross marks from its shoulders down its back. The surface is scored with numerous dots and lines, with four diagonal lines incised on its belly. The legs finish at the knee joint.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer IV
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1931

Cat 31e. Figurine of Bison, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31f**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	31,000 – 36,000 BP
Object Type	Rhinoceros
Dimensions	Length: 5.8 cm Height: 2.4 cm Width: 1.4 cm
Description of object	This bovid is difficult to identify as the shape is not very distinctive (in comparison to the bison), and the head is missing. In comparison to other figurines from Vogelherd (and other cave sites in southwest Germany discussed here), this animal shows only a small number of dots and line notches.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.
Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial

organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.

Associated finds

The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.

Date range of site

Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.

Dating method

Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Gustav Riek, the excavator of the Vogelherd cave, believed that the sculpture represented a bear. Due to the low withers and the strong haunches, it was later suggested that it might represent a rhinoceros.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1931

Cat 31f. Figurine of Rhinoceros, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31g**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	31,000 – 36,000 BP
Object Type	Lion
Dimensions	Length: 8.8 cm Height: 5.25 cm Width: 1.35 cm
Description of object	This sculpture shows a solid, heavy body with strong muscular shoulders. The head is bowed and the ears lay back, displaying some behavioural pose, although difficult to identify. The body and head are covered with numerous rows of dots, and on the side of the torso, a crosshatch pattern made up of four diagonal lines in one direction and six on the other is apparent. Either the legs were not carved originally, or have since broken off.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.
Context	Layer V
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial

	organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	Just after its discovery, traces of red ochre (ferric oxide) were observed on the surface
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1931

Cat 31g. Figurine of lion, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31h**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	33,000 BP
Object Type	Lion's head
Dimensions	Length: 2.5 cm Height: 1.8 cm Width: 0.6 cm
Description of object	Only the head is preserved from this once complete and accurately finished cave lion carving, found after the excavation in a spoil heap. The nose and mouth are well-defined and accurately depicted, while the eyes are only depicted as slits, they appear much more defined due to the way the cheek bone has been carved. The ears are precisely positioned and faithfully depicted. There appears to be horizontal notches incised from the nose up to the top of the head, as well as cross hatch lines that start from just underneath the ear and moves round the neck which may indicate fur or a mane. The head bears a similarity with the lion-man of Höhlenstein-Stadel (Cat.29).
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and people.

Context	Spoil heap
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Württemberg Landesmuseum, Stuttgart, Germany
References	Riek, 1934

Cat 31h. Lion's head, Vogelherd

Image:
http://www.ice-age-art.de/anfaenge_der_kunst/vogelherd/loewenkopf.php

Catalogue No.	**31i**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	31,000 – 36,000 BP
Object Type	Snow leopard
Dimensions	Length: 6.8 cm Height: 2.4 cm Width: 1.45 cm
Description of object	The species classification of this figurine is based on its slender shape. The head slightly bowed and the ears lay back on the head, giving the impression of stalking or lying in wait. Part of the back haunches is missing on one side and the legs either have broken off or were not carved, they finish just above the knee joint. There is no evidence of a tail. Numerous dots mark the torso, perhaps indicating the patterning of the spotted fur or perhaps signifying the woolliness of a winter coat; incised lines are evident down the back of the neck.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer IV
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1931

Cat Ref. 31i. Figurine of snow leopard, Vogelherd

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31j**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	32,000 BP
Object Type	Human figurine
Dimensions	Length: 6.9 cm Width: 1.9 cm Thickness: 1.05 cm
Description of object	Although interpreted as a human representation, this figurine is difficult to identify securely. The head stands out distinctly from the body, although there is no evidence of any facial or cranial features. The torso is long and cylindrical shaped, and appears to curve in, in the middle. The legs terminate just below the thighs. The body is covered with indented rows of dots.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.

Context	Layer IV. This anthropomorphic *Löwenmensch* figurine, was excavated in 1939 from the sixth 20 cm spit from 20 meters deep inside this tunnel-shaped cave.
Description of context	Although excavation methods in the 1930s were not comparable to those of today in regard to revealing spatial organisation of a site, several important attributes of the Aurignacian record at Vogelherd inform us about the use of this space. Most significantly, cultural material was distributed throughout the entire extent of the cave and outside the entrances. The excavator documented six hearth features, four of which were located directly in the cave entrances or just in front of them. Significant portions of the faunal assemblage were recovered from terrace areas just outside the cave openings, and a large pile of mammoth bones and tusks was situated across the southwest entrance. In regard to the fauna, information on the spatial context of specific animal taxa or skeletal parts was not documented during excavation.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS

View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.
Current location	Museum Schloss, Tubingen, Germany
References	Riek, 1934

Cat 31j. Possible human figurine

Image: Hilde Jensen, University of Tübingen

Catalogue No.	**31k**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	35,000 BP
Object Type	Mammoth
Dimensions	Length: 3.7 cm Weight: 7.5 gram
Description of object	This mammoth is the first to be recovered in a complete state. This figurine is slim and exhibits a lean and refined form, yet the powerful legs and tall shoulders give the mammoth a robust and forceful appearance. Uniquely it has a pointed tail, and the trunk is intact and hangs down to the mammoth's feet. The top of the head displays six short horizontal incisions, and the soles of the mammoth's feet show a criss-cross pattern.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.
Context	Layer V.

Description of context	This mammoth is a recent finds from Vogelherd and comes from the same sediment layer as the previous finds.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS
View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals, while Dowson and Porr (2001) and Lewis-Williams (2002) have stressed the importance of mixed representations of animals and humans as evidence for shamanism.

Current location Tübingen University, Germany

References Conard *et al.* 2007

Cat 31k. Mammoth figurine, Vogelherd

Image: De Spiegel Online
http://www.spiegel.de/fotostrecke/fotostrecke-22586.html

Cat 31k. Mammoth figurine, Vogelherd

Image: De Spiegel Online
http://www.spiegel.de/fotostrecke/fotostrecke-22586-4.htm

Catalogue No.	**31l**
Site Name	Vogelherd
Location of Site	Vogelherd cave is located on the edge of the Lone valley, about 1 km northwest of Stetten and northeast of the Alb-Donau county
Date of Artefact	30,000-36,000 BP
Object Type	Lion
Dimensions	Length: 5.6 cm
Description of object	The lion has a long torso with an outstretched neck. The head is small and round and the only facial characteristics that seem apparent are holes depicting the eyes; the head appears incomplete and crudely carved. The legs are completely missing and this may be due to damage before or after deposition. A small stump demonstrates evidence of a tale. One of the most striking visual qualities of this figurine are about 30 finely incised crosses along its spine, starting at the top of the head and terminating at the tail.
Material	Mammoth ivory
Type of site	Cave site. On the basis of the size and content of the assemblages, this site represents a substantial habitation site.
Environmental conditions	The cave is positioned 18 m above the valley floor, is up to 7 metres wide, 3.8 metres in height and 39 metres long. Located in an inconspicuous limestone spur of the Upper Jurassic, it has three entrances, south, southwest and north-oriented. Two distinct ecosystems flank the Lone Valley; the drier plateau to the north, probably a steppic landscape during much of the valley's hominin occupation, and also the expansive flatlands with marshes to the south stretching to the Danube; herds of grazing animals would have moved seasonally in and out of these ranges, using the natural routes dissecting the Lone Valley. Vogelherd's topographic location provides a panoramic view of the surrounding landscape, advantageous to prehistoric groups for monitoring the movements of game, predators, and other people.
Context	Layer V

Description of context	This figurine is a recent find from Vogelherd and comes from the same sediment layers as the previous finds from Riek's excavations.
Associated finds	The Aurignacian lithic inventory numbers just under 6000 pieces. Local Jurassic chert is the dominant raw material; other raw materials acquired from sources located between 5 and 120 km from the site are present but less common. Sources of tool-stone utilized by Aurignacian people from Vogelherd and other Swabian Jura caves generally follow the Danube River in an east-west trajectory. The repertoire of ivory artefacts ranges from the highly crafted animal figurines to unfinished items. For example, more than two dozen ivory rods, pencil-thin and sometimes split lengthwise, might have been intended for bead production, as has been inferred for identical pieces at several French and Belgian Palaeolithic sites. The ivory rods from Vogelherd were found in a bundle, and like some of the lithic inventory, are thought to represent a cache of material intended for future use. These artefacts suggest that ivory-working took place here during the Aurignacian. Endscrapers and burins are frequent, but among these tool types, carinated endscrapers are uncommon, and nosed endscrapers are a bit more frequent, while carinated and busked burins are extremely rare. Spitzklingen (pointed blades) are abundant and one of the characteristics of the Vogelherd.
Date range of site	Aurignacian to Magdalenian; c. 40,000 - 13,000 BP. Occupation during this time is not necessarily continuous and evidence is sometimes ephemeral, suggesting sporadic occupations.
Dating method	Radiocarbon, Thermoluminescence and AMS
View/Perception of Object	3D – portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	Riek (1934) emphasised the importance of palaeoecology and hunting magic, Hahn (1986), argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals.

Current location Tubingen University, Germany

References Conard *et al.* 2007

Cat 31l. Figurine of lion, Vogelherd

Image: De Spiegel Online
http://www.spiegel.de/fotostrecke/fotostrecke-22586-3.html

Lab Number	AH	Material	Modification	Date	Cultural group	Reference
AMS dates						
OxA-10196	III	mammoth tooth dentin (root)		25 780 ± 250	?	
OxA-10198	III	giant deer tooth dentin (root)		26 110 ± 310	?	
OxA-10195	III	mammoth tooth dentin (root)		31 680 ± 310	Aurignacian	
OxA-10197	III	woolly rhino. tooth dentin (root)		39 700 ± 650	?	
KIA 8966	IV	bovid/horse femur frag	Cutmarks	13 015 ± 55	Magdalenian	
KIA 8957	IV	longbone frag	Cutmarks	26 160 ± 150	?	Conard & Bolus, 2003
PL0001340A	IV/V	reindeer metatarsal	Cutmarks	13 630 ± 410	Magdalenian	
KIA 19542	?	brown bear canine	Incised	29 620 ± 210	Aurignacian	
PL0001339A	IV/V	horse tibia Aurignacian	Cutmarks and fresh break	32 180 ± 960		Conard & Bolus, 2003
PL0001342A	IV/V	bovid/horse rib	Cutmarks	34 100 ± 1100	Aurignacian	Conard & Bolus, 2003
KIA 8968	V ML	small artiodactyl tibia	impact fracture	31 790 ± 240	Aurignacian	Conard & Bolus, 2003
PL0001338A	V ML	horse tibia	Cutmarks	32 400 ± 1700	Aurignacian	Conard & Bolus, 2003
KIA 8969	V	reindeer longbone frag	impact fracture	32 500 +260/-250	Aurignacian	Conard & Bolus, 2003
KIA 8970	V ML	horse longbone frag	impact fracture	33 080 +320/-310	Aurignacian	Conard & Bolus, 2003
PL0001337A	V	bovid/horse longbone frag	Cutmarks	35 810 ± 710	Aurignacian	Conard & Bolus, 2003
Conventional Dates	**AH**	**Material**	**Modification**	**Date**	**Cultural Group**	**Reference**
H-4035-3209	V	bone-Mammoth?		23 020 ± 400	?	Hahn, 1977

GrN-6583	IV/V	mixed bone sample	23 860 ± 190	?	Hahn, 1977
GrN-6662	IV/V	burned bone	27 630 ± 830	?	Hahn, 1977
H-8498-8950	V	mixed bone sample	25 900 ± 260	?	Hahn, 1993
H-8497-8930	V	mixed bone sample	27 200 ± 400	?	Hahn, 1993
H-4054-3210	V	mixed bone sample	30 162 ± 1340	Aurignacian	Hahn, 1977
H-8500-8992	V	mixed bone sample	30 600 ± 1700	Aurignacian	Hahn, 1993
GrN-6661	V	burned bone	30 650 ± 560	Aurignacian	Hahn, 1977
H-4053-3211	IV	mixed bone sample	30 730 ± 750	Aurignacian	Hahn, 1977
H-8499-8991	V	mixed bone sample	31 350 ± 1120	Aurignacian	Hahn, 1993
H-4056-3208	V	mixed bone sample	31 900 ± 1100	Aurignacian	Hahn, 1977

Table A1. Comprehensive summary of AMS (top) and conventional (bottom) radiocarbon dates from Vogelherd Conard, Niven and Stuart, 2003:84

Catalogue No.	**32a**
Site Name	Höhle Fels
Location of Site	Höhle Fels is located in the Ach Valley near the town of Schelklingen, 20 km southwest of Ulm, southern Germany, and about 2 km from Geissenklösterle cave.
	.
Date of Artefact	31-33,000 BP
	Archaeological horizon IV has yielded three AMS radiocarbon dates; (OxA-4600 - Reindeer metapodial) 31,100 ±600; (KIA 18879 - Unidentified charcoal) 31,160 +1,530/-1280; (KIA 16036 - Horse femur Tool (retoucher) 33,090 +260/-250.
Object Type	Small lion-man or *löwenmensch*
Dimensions	Height: 2.55 cm
Description of object	The figurine is difficult to identify, it may be human, animal or a hybrid figure. The legs of the figurine are missing, but the remaining fragment includes the head, torso, arm, shoulder and buttocks of an upright figure. The shoulder is angular and the posture rigid. A subtly carved ear is visible high on the head and the nose and mouth are visible. The arm is short and tapered with an incised vertical line.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Work on the fauna from the Ach Valley sites indicates that the caves of the region were used repeatedly in the winter and spring for relatively lengthy occupations. Some of these horizons have produced hundreds of pieces of debris from ivory working. By the Upper Aurignacian, at the time the figurines were produced, there was a decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment. Bird species that prefer woodland or forest are usually present - except during the very coldest intervals - mixed in with species characteristic of more open vegetation, suggesting isolated clumps or pockets of woodland, rather a continuous cover.

Context	Recovered from Layer AH IV in 2002
Description of context	The first excavation took place in 1870, and intermittently excavated since 1958. In 1999, the excavation team reached the Aurignacian deposits, which, in addition to numerous lithics and organic artefacts, yielded three mammoth ivory figurines. Archaeological horizon IV is the richest of the Aurignacian deposits at Höhle Fels of which only 9m² has been excavated.
Associated finds	The deposit has provided a rich assemblage of lithic and organic artefacts, including diverse forms of finely carved ivory ornaments and much ivory working debris.
Date range of site	Aurignacian – Magdalenian. c. 40,000 – 15,000 BP
Dating method	Radiocarbon and AMS dating
View/Perception of Object	3D – Portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Interpretations	It is interpreted as having a mixture of felid and human traits, "showing marked similarities to the *Löwenmensch* from Höhlenstein-Stadel. The similarities to the figurine from Höhlenstein-Stadel are based on the form and posturing of the head, the shape of the cranium is similar, and despite the Höhle Fels facial features being undefined, they appear similar to Höhlenstein-Stadel. In addition, the way in which the head is slightly raised is similar to the much taller *Löwenmensch*.
Current location	Urgeschichtliches Museum, Blaubeuren
References	Tyrberg 1998; Conard & Uepermann, 2002; Conard 2003; Conard *et al.* 2006

Cat 32a. Small lion-man or *löwenmensch,* Höhle-Fels

Image: http://www.ice-age-art.de/anfaenge_der_kunst.php

Catalogue No.	**32b**
Site Name	Höhle Fels
Location of Site	Höhle Fels is located in the Ach Valley near the town of Schelklingen, 20 km southwest of Ulm, southern Germany, and about 2 km from Geissenklösterle cave.
Date of Artefact	31-33,000 BP Archaeological horizon IV has yielded three AMS radiocarbon dates; (OxA-4600 - Reindeer metapodial) 31,100 ±600; (KIA 18879 - Unidentified charcoal) 31,160 +1,530/-1280; (KIA 16036 - Horse femur Tool (retoucher)) 33,090 +260/-250.
Object Type	Waterbird
Dimensions	Length: 4.7 cm Height: 1.3 cm Width: 0.9 cm.
Description of object	The neck appears extended and the wings are sculpted close to the body, appearing to be in flight or perhaps diving. The eyes are visible and the beak is more pointed than those commonly seen on ducks. The legs are short with no indications of feet and the tail extends below the legs. Incised lines on the back of the bird are thought to represent feathers.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Work on the fauna from the Ach Valley sites indicates that the caves of the region were used repeatedly in the winter and spring for relatively lengthy occupations. Some of these horizons have produced hundreds of pieces of debris from ivory working. By the Upper Aurignacian, at the time the figurines were produced, there was a decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment. Bird species that prefer woodland or forest are usually present - except during the very coldest intervals - mixed in with species characteristic of more open vegetation, suggesting isolated clumps or pockets of woodland, rather a continuous cover.

Context	The body of the waterbird was discovered in 2001 from layer AH IV near the bottom of the Aurignacian sequence. In 2002, the head and neck of the figurine were recovered from the same stratigraphic layer.
Description of context	The first excavation took place in 1870, and intermittently excavated since 1958. In 1999, the excavation team reached the Aurignacian deposits, which, in addition to numerous lithics and organic artefacts, yielded three mammoth ivory figurines. Archaeological horizon IV is the richest of the Aurignacian deposits at Höhle Fels of which only 9m² has been excavated.
Associated finds	The deposit has provided a rich assemblage of lithic and organic artefacts, including diverse forms of finely carved ivory ornaments and much ivory working debris.
Date range of site	Aurignacian – Magdalenian. c. 40,000 – 15,000 BP
Dating method	Radiocarbon and AMS dating
View/Perception of Object	3D – Portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Interpretations	This figurine is thought to represent a morphology similar to that of a diver, cormorant or duck.
Current location	Urgeschichtliches Museum Blaubeuren
References	Conard, Uerpmann 2001 and 2002; Conard, 2003

Cat 32b. Figurine of waterbird, Höhle Fels

Image: http://www.ice-age-art.de/anfaenge_der_kunst.php

Catalogue No.	**32c**
Site Name	Höhle Fels
Location of Site	Höhle Fels is located in the Ach Valley near the town of Schelklingen, 20 km southwest of Ulm, southern Germany, and about 2 km from Geissenklösterle cave.
Date of Artefact	The horse head dates to between 29,560 +240/-230 and 31,140 +250/-240, Archaeological horizon IId (base) provides two AMS radiocarbon dates of 29,560 +240/-230 (KIA 8964 - mammoth/rhino rib) and 30,010 ±220 (KIA 8965 - reindeer antler). IIe provided a date of 30,640 ±190 (KIA 16040 - horse pelvis). The underlying layer IIIa provided 5 AMS radiocarbon dates of (KIA 16038 - Reindeer femur) 29,840±10; (KIA 18877 - Pinus charcoal) 30,170 +250/-240; (OxA-4601 – Bone) 30,550 ±550; (KIA 18876 - Pinus charcoal) 31,010 +600/-560; (KIA 16039 - Small ungulate femur) 31,140 +250/-240.
Object Type	Horse's head
Dimensions	Length: 3.6 cm Width: 0.7 cm Height: 1.5 cm
Description of object	The sides of the face and underside of the jaw show fine, regular crosshatching and parallel lines. The mouth, nostrils and eyes of the animal are clearly engraved, and the physiognomy of the cranium is very equine in appearance. The remainder of the figurine may be missing or potentially the head was the only fragment produced. If there are further remains of this figurine, the finished product would have been one of the larger objects produced in this area.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Work on the fauna from the Ach Valley sites indicates that the caves of the region were used repeatedly in the winter and spring for relatively lengthy occupations. Some of these horizons have produced hundreds of pieces of debris from ivory working. By the Upper Aurignacian, at the time the figurines were produced, there was a decline in tundra elements and intensification of wooded and boreal species,

	demonstrating an increasingly temperate environment. Bird species that prefer woodland or forest are usually present - except during the very coldest intervals - mixed in with species characteristic of more open vegetation, suggesting isolated clumps or pockets of woodland, rather a continuous cover.
Context	In 1999, the largest part of a carving of this animal's head was discovered in the transition between archaeological horizons (AH) IId and IIe, fitting to a piece of the animal's cheek from the underlying layer AH IIIa.
Description of context	The first excavation took place in 1870, and intermittently excavated since 1958. In 1999, the excavation team reached the Aurignacian deposits, which, in addition to numerous lithics and organic artefacts, yielded three mammoth ivory figurines. Archaeological horizon IV is the richest of the Aurignacian deposits at Höhle Fels of which only 9m² has been excavated.
Associated finds	The deposit has provided a rich assemblage of lithic and organic artefacts, including diverse forms of finely carved ivory ornaments and much ivory working debris.
Date range of site	Aurignacian – Magdalenian. c. 40,000 – 15,000 BP
Dating method	Radiocarbon and AMS dating
View/Perception of Object	3D – Portable object
Source of Raw Material	Unknown, but probably locally sourced
Mode of production	Carved
Microanalysis	?
Interpretations	It strongly resembles the head of a horse, although it could possibly represent a bear or another animal.
Current location	Urgeschichtliches Museum Blaubeuren
References	Conard, Uerpmann 1999; Conard, 2003

Cat 32c. Horse's head, Höhle Fels

Image: http://www.ice-age-art.de/anfaenge_der_kunst.php

Catalogue No.	**32d**
Site Name	Höhle Fels
Location of Site	Höhle Fels is located in the Ach Valley near the town of Schelklingen, 20 km southwest of Ulm, southern Germany, and about 2 km from Geissenklösterle cave.
Date of Artefact	30,000 – 40,000 BP
Object Type	Figurine of a woman
Dimensions	Height: 5.97 cm Width: 3.46 cm Thickness: 3.13 cm Weight: 33.3 g
Description of object	"The shape of the preserved part of the figurine is asymmetrical, with the right shoulder elevated above the left side of the figurine. Beneath the shoulders, which are roughly as thick as they are wide, large breasts project forwards. The figurine has two short arms with two carefully carved hands resting on the upper part of the stomach below the breasts. Each hand has precisely carved fingers, with five clearly visible on the left hand and four on the right hand. The navel is visible and correctly placed anatomically. The Venus has a short, squat form with a waist slightly narrower than the broad shoulders and wide hips. Multiple, deeply incised horizontal lines cover the abdomen from the area below the breasts to the pubic triangle. Several of these horizontal lines extend to the back of the figurine… Microscopic images show that these incisions were created by repeatedly cutting along the same lines with sharp stone tools. Such deep cuts into ivory are only possible with the application of significant force. The legs of the Venus are short, pointed and asymmetrical, with the left leg noticeably shorter than the right leg. The buttocks and genitals are depicted in more detail. The split between the two halves of the buttocks is deep and continues without interruption to the front of the figurine, where the vulva with pronounced labia majora is visible between the open legs… In addition to the many carefully depicted anatomical features, the surface of the Venus preserves numerous lines and markings. The top of the Venus shows a series of U-shaped incisions on the roughly flat surface formed by the top of the breasts and the shoulders. The shoulders preserve multiple markings, with the short, deep, vertically incised lines along the back side of the figurine being the most pronounced. The breasts and arms also have multiple short,

	deeply incised lines that add to the three dimensionality of the sculpture. These markings are reminiscent of the various incisions found on other examples of ivory figurines from the Swabian Aurignacian, but, as is true of the others, this depiction is unique". (Conard, 2009:250)
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Work on the fauna from the Ach Valley sites indicates that the caves of the region were used repeatedly in the winter and spring for relatively lengthy occupations. Some of these horizons have produced hundreds of pieces of debris from ivory working. By the Upper Aurignacian, at the time the figurines were produced, there was a decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment. Bird species that prefer woodland or forest are usually present - except during the very coldest intervals - mixed in with species characteristic of more open vegetation, suggesting isolated clumps or pockets of woodland, rather a continuous cover.
Context	The stratigraphic position of the Venus of Höhle Fels indicates that it is the oldest of all of the figurines recovered from the Swabian caves and perhaps the earliest example of figurative art worldwide.
Description of context	Found in six pieces, only the left arm and shoulder are missing. The figurine originates from a red-brown, clayey silt at the base of 1m of Aurignacian deposits. One fragment was attributed to feature 10, a small area rich in charcoal at the base of archaeological horizon Va, directly overlying archaeological horizon Vb. The remaining five pieces were recovered from archaeological horizon Vb, which is an approximately 8-cm-thick deposit of clayey silt directly overlying the sterile clays that separate the Aurignacian from the underlying Middle Palaeolithic strata. The Venus lay in pieces next to a number of limestone blocks with dimensions of several decimetres.
Associated finds	The find density in this part of archaeological horizon Vb is moderately high, with much flint-knapping debris, worked bone and ivory, faunal remains of horse, reindeer, cave bear, mammoth and ibex, and burnt bone.

Date range of site	Aurignacian – Magdalenian. c. 40,000 – 15,000 BP
Dating method	Radiocarbon and AMS dating. From feature 10 and archaeological horizon Vb have been made at the Oxford Radiocarbon Accelerator Unit. Four of the dates fall between 31,300 and 32,100 BP. Two other dates fall in the range 34,600– 34,700 BP. One bone dates from 40,000 BP. The new series of dates on bones from the vicinity of the Venus were all made on collagen processed using ultrafiltration. The amount of collagen ranged from 2.2 to 11.4% in the six bones sampled. Two additional measurements on bone and one on charcoal from the 2002 excavation were made at the Leibniz Laboratory, Kiel, and yielded dates between 33,300 and 35,700 BP. These finds come from the same stratigraphic position 2m farther to the southeast. The samples from the 2002 excavation were initially classified as belonging to archaeological horizon Va, but on stratigraphic grounds have been redesignated as belonging to archaeological horizon Vb. Five dates of bones recovered during the 2007 excavation from archaeological horizon Va, in a find-rich wedge of sediment between archaeological horizons IV and Vb, were measured in Kiel and fall in the range 31,700–32,300 BP. Previously, a sculpture of a waterfowl and a therianthrope were recovered from archaeological horizon IV, where nine radiocarbon dates measured in Kiel and Oxford on bone fall between 30,000 and 33,000 BP. All of the bones measured in Kiel were well preserved and yielded between 6.4 and 18.6% collagen. Most of the bones dated at Kiel and Oxford show anthropogenic modifications, and the two pieces of charcoal from archaeological horizon Vb almost certainly originate from anthropogenic fires. This wide range of dates from archaeological horizon Vb presents a situation similar to that from the nearby site of Geissenklösterle, where the lower Aurignacian deposit of archaeological horizon III has produced 33 radiocarbon dates between 29,000 and 40,000 BP. The same horizon has yielded thermoluminescence dates in the range of 40,000 BP. The fact that the figurine is overlain by five Aurignacian horizons, containing a dozen stratigraphically intact anthropogenic features with a total thickness of 1 m, suggests that the figurine is of an age corresponding to the start of the Aurignacian, around 40,000 calendar years ago.
View/Perception of Object	3D – Portable object – potentially used as a pendant.
Source of Raw Material	Unknown, but probably locally sourced

Mode of production	Carved. Because carvings in mammoth ivory record many details, numerous specific observations can be made that allow comparisons with other Palaeolithic artworks. The vertical axis of the figurine runs parallel to the long axis of the mammoth tusk. The structure of the ivory shows that the two legs are oriented towards the proximal end of the tusk and the shoulders towards the distal end.
Microanalysis	The figurine shows no signs of having been covered with pigments. One of the most noticeable features of the figurine is the absence of a head; instead, an off-centre ring is located above the broad shoulders. This loop preserves evidence of polish, indicating that it was probably suspended. Multiple, deeply incised horizontal lines cover the abdomen from the area below the breasts to the pubic triangle. Several of these horizontal lines extend to the back of the figurine and are suggestive of clothing or a wrap of some kind. Microscopic images show that these incisions were created by repeatedly cutting along the same lines with sharp stone tools. Such deep cuts into ivory are only possible with the application of significant force.
Interpretations	Many of the features, including the extreme emphasis on sexual attributes and lack of emphasis on the head, face and arms and legs, call to mind aspects of the Venus figurines well known from the European Gravettian, which typically date from between 22,000 and 27,000 BP. The careful depiction of the hands is reminiscent of those of Venuses such as the archetypal Venus of Willendorf—which was discovered 100 years earlier, in the summer of 1908—and a Venus from Kostenki I. Despite the far greater age of the Venus of Höhle Fels, many of its attributes can be found in various forms in the rich tradition of Palaeolithic female representations. Although the Venus has numerous unique features, the presence of a ring for suspension in place of the head, and the upright, oversized breasts and massive shoulders relative to the flat stomach and small, pointed legs are particularly noteworthy. The new figurine from Höhle Fels radically changes our view of the origins of Palaeolithic art.
Current location	Tübingen University, Germany
References	Conard, 2009

Cat 32d. Figurine of a woman or So-Called ‘Venus’ figurine, Höhle Fels

Cat 32d. Figurine of a woman or So-Called ‘Venus’ figurine, Höhle Fels

Images: Conard, 2009

Catalogue No.	**33a**
Site Name	Geissenklösterle
Location of Site	Geissenklösterle lies in the Ach Valley at Blaubeuren, about 2 km northeast of Höhle Fels.
Date of Artefact	32,300±700 – 36,800±1000 BP
Object Type	Standing bear
Dimensions	Length: 5 cm Height: 2.1 cm Width: 1.9 cm
Description of object	Reconstructed from 11 pieces of ivory, the posture shows the animal's arms outstretched and its head raised, tilting upwards with the mouth slightly opened; the body is covered with incised lines and notches.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Geissenklösterle is part of a limestone massive, a rock formation which rises 60 m above the valley bottom, and which was 10 m deeper during the Pleistocene. Micromorphological data from Geissenklösterle indicates that in the lower Aurignacian period there was a decrease in tundra elements and an increase in boreal fauna indicating a slightly warmer period. By the Upper Aurignacian, at the time of the figurines, there was a further decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment.
Context	Layer IIa
Description of context	The presence of large hearth areas with thick layers of burned bone is particularly notable in the AH II layer. The deepest layer exposed so far contains finds from the Middle Palaeolithic (layer IV), stratified above this is a Lower Aurignacian (layer III) layer, AMS radiocarbon dated to c.38,400 BP and c. 40,200 BP by thermoluminescence (TL), followed by the Upper Aurignacian (layer II), which was AMS radiocarbon dated to c. 33,500 BP and with TL to c. 37,000 BP. The Aurignacian can be subdivided into a lower and an upper Aurignacian. The 33 radiocarbon dates from archaeological materials from the Aurignacian of Geissenklösterle fall almost entirely between 30,000 – 40,000 BP.

Date range of site	Geissenklösterle has an extensive sequence of settlement phases, providing a stratigraphic sequence from at least 43,000 up to 10,000 BP. The Geissenklösterle sequence has been considered as the most serious candidate for the presence of a very early Aurignacian in central Europe. Indeed, the lowest layers of the sequence (IIIb, IIIa and III) yielded five radiocarbon dates, both AMS and conventional, falling into the range between about 36,500 and about 40,000 BP. Moreover, six TL dates on burnt flints provide a mean age of 40,200±1,500 BP, while two TL dates on burnt flints for the upper Aurignacian horizon (AH II) yielded ages of c.37,000 BP.
Dating method	Radiocarbon Dating Thermoluminescence Accelerator Mass Spectometry
View/Perception of Object	3D – Portable object
Source of Raw Material	The bone weight analysis of the Geissenklösterle fauna shows that mammoth is the most important game animal after the horse. In the Aurignacian layer (AH II), remains of several very young mammoths were found, including skull fragments, milk tusks, foot bones and finger bones. These remains are from at least three infants of ca. 2 months of age. In addition, ivory and ribs of older individuals are present.
Mode of production	Carved
Interpretations	Interpreted as a standing or erect bear
Current location	Württemberg Landesmuseum, Stuttgart
References	Hahn 1974 and 1977; Richter *et al*. 2000; Münzel, 2001; Conard *et al*. 2003; Teyssandier *et al*. 2006

Cat 33a. Figure of a standing bear, Geissenklösterle

Image: www.aurignacien.de/en/a-br-art.ph

Catalogue No.	**33b**
Site Name	Geissenklösterle
Location of Site	Geissenklösterle lies in the Ach Valley at Blaubeuren, about 2 km northeast of Höhle Fels.
Date of Artefact	32,300±700 – 36,800±1000 BP
Object Type	Mammoth
Dimensions	Length: 6.7 cm Height: 3.8 cm Width: 2.9 cm
Description of object	This sculpture was pieced together and reconstructed from more than 40 single fragments. Ivory grows in layers, so fossil ivory very often disintegrates into single flakes. Unfortunately, the lower parts of the head and trunk are missing, and no facial features are distinguishable. The shape of the body is thought clearly to indicate a mammoth, however, in comparison to the mammoth figurines located at Vogelherd, this is less accurately depicted and therefore less easy to identify. The surface of the body is incised with horizontal lines covering the length of the body, between which are obliquely oriented lines, almost like a herringbone pattern.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Geissenklösterle is part of a limestone massive, a rock formation which rises 60 m above the valley bottom, and which was 10 m deeper during the Pleistocene. Micromorphological data from Geissenklösterle indicates that in the lower Aurignacian period there was a decrease in tundra elements and an increase in boreal fauna indicating a slightly warmer period. By the Upper Aurignacian, at the time of the figurines, there was a further decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment.
Context	Layer IIa
Description of context	The presence of large hearth areas with thick layers of burned bone is particularly notable in the AH II layer. The deepest layer exposed so far contains finds from the Middle Palaeolithic (layer IV), stratified above this is a Lower Aurignacian (layer III) layer, AMS radiocarbon dated to c.38,400 BP and c. 40,200 BP by

	thermoluminescence (TL), followed by the Upper Aurignacian (layer II), which was AMS radiocarbon dated to c. 33,500 BP and with TL to c. 37,000 BP. The Aurignacian can be subdivided into a lower and an upper Aurignacian. The 33 radiocarbon dates from archaeological materials from the Aurignacian of Geissenklösterle fall almost entirely between 30,000 – 40,000 BP.
Date range of site	Geissenklösterle has an extensive sequence of settlement phases, providing a stratigraphic sequence from at least 43,000 up to 10,000 BP. The Geissenklösterle sequence has been considered as the most serious candidate for the presence of a very early Aurignacian in central Europe. Indeed, the lowest layers of the sequence (IIIb, IIIa and III) yielded five radiocarbon dates, both AMS and conventional, falling into the range between about 36,500 and about 40,000 BP. Moreover, six TL dates on burnt flints provide a mean age of 40,200±1,500 BP, while two TL dates on burnt flints for the upper Aurignacian horizon (AH II) yielded ages of c.37,000 BP
Dating method	Radiocarbon Dating Thermoluminescence Accelerator Mass Spectometry
View/Perception of Object	3D – portable object
Source of Raw Material	The bone weight analysis of the Geissenklösterle fauna shows that mammoth is the most important game animal after the horse. In the Aurignacian layer (AH II), remains of several very young mammoths were found, including skull fragments, milk tusks, foot bones and finger bones. These remains are from at least three infants of ca. 2 months of age. In addition, ivory and ribs of older individuals are present.
Mode of production	Carved
Microanalysis	Probably none undertaken because it was found in 40 fragments.
Interpretations	The shape of the body is thought to clearly indicate a mammoth.
Current location	Württemberg Landesmuseum, Stuttgart

References Hahn 1974; Munzel, 2001; Conard *et al*. 2003; Teyssandier *et al.* 2006

Cat 33b. Figurine of a Mammoth, Geissenklösterle

Image: http://www.ice-age-art.de/anfaenge_der_kunst/geissen/mammut.ph

Catalogue No.	**33c**
Site Name	Geissenklösterle
Location of Site	Geissenklösterle lies in the Ach Valley at Blaubeuren, about 2 km northeast of Höhle Fels.
Date of Artefact	33,500 - 37,000 BP
Object Type	Bas-relief of a human being with raised arms
Dimensions	Length: 3.8 cm Height: 1.4 cm Width: 0.45 cm
Description of object	The image shows an obverse bipedal upright form, with limbs raised, the right of which show five horizontal lines. All facial features are missing, including any physiological characteristics that may determine if this depiction is human or animal. The torso is quite long and the thighs and legs appear reasonably muscular and robust. There appears to be a protrusion hanging down between the legs, but this may be a consequence of flaking of the material, rather than an intentional feature. There are a series of notches (possibly 8 on each side) located down each side of the ivory segment. On the reverse are four vertical rows of dots, the first row comprises 12 dots, the second, 10 dots, and the last 2 rows also 12 dots.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Geissenklösterle is part of a limestone massive, a rock formation which rises 60 m above the valley bottom, and which was 10 m deeper during the Pleistocene. Micromorphological data from Geissenklösterle indicates that in the lower Aurignacian period there was a decrease in tundra elements and an increase in boreal fauna indicating a slightly warmer period. By the Upper Aurignacian, at the time of the figurines, there was a further decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment.

Context	Stratum IIb
Description of context	An ashy bone layer near a possible hearth. The deepest layer exposed so far contains finds from the Middle Palaeolithic (layer IV), stratified above this is a Lower Aurignacian (layer III) layer, AMS radiocarbon dated to c.38,400 BP and c. 40,200 BP by thermoluminescence (TL), followed by the Upper Aurignacian (layer II), which was AMS radiocarbon dated to c. 33,500 BP and with TL to c. 37,000 BP. The Aurignacian can be subdivided into a lower and an upper Aurignacian. The 33 radiocarbon dates from archaeological materials from the Aurignacian of Geissenklösterle fall almost entirely between 30,000 – 40,000 BP.
Date range of site	Geissenklösterle has an extensive sequence of settlement phases, providing a stratigraphic sequence from at least 43,000 up to 10,000 BP. The Geissenklösterle sequence has been considered as the most serious candidate for the presence of a very early Aurignacian in central Europe. Indeed, the lowest layers of the sequence (IIIb, IIIa and III) yielded five radiocarbon dates, both AMS and conventional, falling into the range between about 36,500 and about 40,000 BP. Moreover, six TL dates on burnt flints provide a mean age of 40,200 ±1,500 BP, while two TL dates on burnt flints for the upper Aurignacian horizon (AH II) yielded ages of c.37,000 BP
Dating method	Radiocarbon Dating Thermoluminescence Accelerator Mass Spectometry
View/Perception of Object	3D – portable object
Source of Raw Material	The bone weight analysis of the Geissenklösterle fauna shows that mammoth is the most important game animal after the horse. In the Aurignacian layer (AH II), remains of several very young mammoths were found, including skull fragments, milk tusks, foot bones and finger bones. These remains are from at least three infants of ca. 2 months of age. In addition, ivory and ribs of older individuals are present.
Mode of production	Carved

Microanalysis	Traces of manganese and red ochre (ferric oxide) were found on the reverse.
Interpretations	Interpreted as human being with raised arms, who seems to be either saluting or threatening. The raised arms might also be interpreted as an attitude of worship, so the statuette was named the "Adorant". The figure stands erect with legs apart and a tail-like extension down between its legs. It may depict a hybrid creature similar to the Lion-Man from Höhlenstein-Stadel cave. It is associated with such hybrid figures from Palaeolithic cave paintings in France.
Current location	Württemberg Landesmuseum, Stuttgart
References	Hahn, 1979; Münzel, 2001; Conard *et al.* 2003; Teyssandier *et al*. 2006

Cat 33c. Bas-relief of a human being with raised arms, Geissenklösterle

Images: http://www.ice-age-art.de/anfaenge_der_kunst/geissen/adorant.php

Catalogue No.	**33d**
Site Name	Geissenklösterle
Location of Site	Geissenklösterle lies in the Ach Valley at Blaubeuren, about 2 km northeast of Höhle Fels.
Date of Artefact	33,500 - 37,000 BP
Object Type	Bison in bas-relief
Dimensions	Length: 2.55 cm Height: 1.45 cm Width: 0.6 cm
Description of object	The shape of the body and the high shoulders is suggestive of a bison. The facial features are not very clear, but analysis proposes there are faint hints of a beard and a horn. There are six vertical incised lines along the torso and small incisions run along the length of the neck and backbone to the back of the haunches.
Material	Mammoth ivory
Type of site	Cave site
Environmental conditions	Geissenklösterle is part of a limestone massive, a rock formation which rises 60 m above the valley bottom, and which was 10 m deeper during the Pleistocene. Micromorphological data from Geissenklösterle indicates that in the lower Aurignacian period there was a decrease in tundra elements and an increase in boreal fauna indicating a slightly warmer period. By the Upper Aurignacian, at the time of the figurines, there was a further decline in tundra elements and intensification of wooded and boreal species, demonstrating an increasingly temperate environment.
Context	Layer IIb
Description of context	Ashy bone layer near a possible hearth. The deepest layer exposed so far contains finds from the Middle Palaeolithic (layer IV), stratified above this is a Lower Aurignacian (layer III) layer, AMS radiocarbon dated to c.38,400 BP and c. 40,200 BP by thermoluminescence (TL), followed by the Upper Aurignacian (layer II), which was AMS radiocarbon dated to c. 33,500 BP and with TL to c. 37,000 BP. The Aurignacian can be subdivided into a lower and an upper Aurignacian. The 33 radiocarbon dates from archaeological materials from the Aurignacian of Geissenklösterle fall almost entirely between 30,000 – 40,000 BP

Date range of site	Geissenklösterle has an extensive sequence of settlement phases, providing a stratigraphic sequence from at least 43,000 up to 10,000 BP. The Geissenklösterle sequence has been considered as the most serious candidate for the presence of a very early Aurignacian in central Europe. Indeed, the lowest layers of the sequence (IIIb, IIIa and III) yielded five radiocarbon dates, both AMS and conventional, falling into the range between about 36,500 and about 40,000 BP. Moreover, six TL dates on burnt flints provide a mean age of 40,200±1,500 BP, while two TL dates on burnt flints for the upper Aurignacian horizon (AH II) yielded ages of c.37,000 BP
Dating method	Radiocarbon Dating Thermoluminescence Accelerator Mass Spectometry
View/Perception of Object	3D – portable object
Source of Raw Material	The bone weight analysis of the Geissenklösterle fauna shows that mammoth is the most important game animal after the horse. In the Aurignacian layer (AH II), remains of several very young mammoths were found, including skull fragments, milk tusks, foot bones and finger bones. These remains are from at least three infants of ca. 2 months of age. In addition, ivory and ribs of older individuals are present.
Mode of production	Carved
Interpretations	The faint hints of a beard and a horn leads to the assumption that this probably depicts a bison.
Current location	Württemberg Landesmuseum, Stuttgart
References	Hahn 1983; Münzel, 2001; Conard *et al.* 2003; Teyssandier *et al.* 2006

Cat 33d. Bison in bas-relief, Geissenklösterle

Image: http://www.ice-age-art.de/anfaenge_der_kunst/geissen/bison.php

Catalogue No.	**34**
Site Name	Galgenberg
Location of Site	Located near Stratzing, Lower Austria
Date of Artefact	Charcoal samples from the same stratigraphic layer in which the figurine was found have produced radiocarbon dates of 29,200 – 31,900 BP
Object Type	Human figurine
Dimensions	Height: 7.2 cm Width: 2.7 cm Thickness: 0.7 cm
Description of object	The figurine depicts a standing human form; the thickened limbs are conjoined at the base, supporting the statue. There are no features on the cranium or face, and the absence of any overt sexual organs makes this an androgynous figure in comparison to the Höhle Fels figurine. The right arm rests on the upper right thigh, but the left arm is ambiguous in its positioning, although it is interpreted as if, “folded back at the elbow”. However, the pose can also be read as if holding something aloft. The body weight appears to be supported predominantly on the left leg, while the right is slightly bent at the knee. Flattish in appearance, rather than sculpted in the round, this may due to the characteristics of the stone used, which often occurs in slabs. There are no defined morphological attributes such as facial features, fingers, hair, or sexual organs.
Material	Blackish green amphibolite
Type of site	Open air settlement site
Context	Layer II
Description of context	Originally found broken in eight pieces near a campfire on an open-air habitation site. Layer I: 4 fire places Layer II: 11 fire places. Dating: between approx. 33,000 and 28,000 BP.
Associated finds	Charcoal and tools of stone were found at various fire places. Special constructions probably served as shelters. Bones of horses and mammoths as well as antlers were found.
Dating method	Dating is based on the 14 C-dating of surrounding wood scraps.

View/Perception of Object	3D – Portable object
Source of Raw Material	The stone material is from the immediate vicinity of where the figurine was found, and the waste material provides proof that the figurine was made in the same area.
Mode of production	Carved
Microanalysis	?
Interpretations	Because of its moving, dancing attitude it was spontaneously christened "Fanny" - after the famous Viennese dancer Fanny Elssler; it has been dubbed the ‘Dancing Venus of Galgenberg’.
Current location	Natural History Museum, Vienna
References	Bahn, 1989; Neugebauer-Maresch, 1993

Cat 34. So-called ‘Venus’ of Galgenberg

Images: Don Hitchcock, 2008
http://www.donsmaps.com/galgenbergvenus.html

Catalogue No.	**35**
Site Name	Carpenter's Gap
Location of Site	Napier Ranges, central Kimberley, Western Australia
Date of Artefact	c. 40,000 BP
Object Type	Painted rock
Dimensions	Length: 20.5 cm Width: 7.5 cm Thickness: 2.8 cm
Description of object	Originally the stained limestone slab was attached to either the ceiling or wall of the rockshelter, as a ledge. The ochre seems to have been applied by a method resulting in a thin even coating, possibly by blowing of wet pigment.
Material	Limestone slab covered on top and bottom and one side with ochre, once attached to parent rock.
Type of site	Rockshelter
Environmental conditions	Before about the last glacial maximum, the climate was one of higher absolute rainfall, slightly cooler temperatures, and lower evaporation rates than today. Sea levels fluctuated but were usually substantially lower than today, reaching 130+10 m at 20,000 years BP.
Context	The limestone slab was recovered from Spit 47 close to the base of Square A in the first excavation season.
Description of context	In all, five 1m x 1m squares were excavated, Squares A and B in the 1993 field season and Squares A1, A2 and AA, adjoining square A in the 1994 field season.
Associated finds	The limestone slab was found with an ochre pellet, but analysis has shown that the composition of this ochre is not the same as the ochre on the limestone slab. The stone artefacts are predominantly quartz, much of it crystal quartz. In Spit 47 there is a slight increase in the number of stone artefacts. In this spit burnt bone and ochre are associated with the piece of ochre covered roof fall.
Date range of site	The date from the lower levels indicates occupation of this region prior to 39,700 ± 1000 BP. This sample does not date the base of the site or the lowest stone artefacts and merely indicates a minimum age for occupation. The shelter has a date from approximately 20 cm below this of 49,700±870 BP.

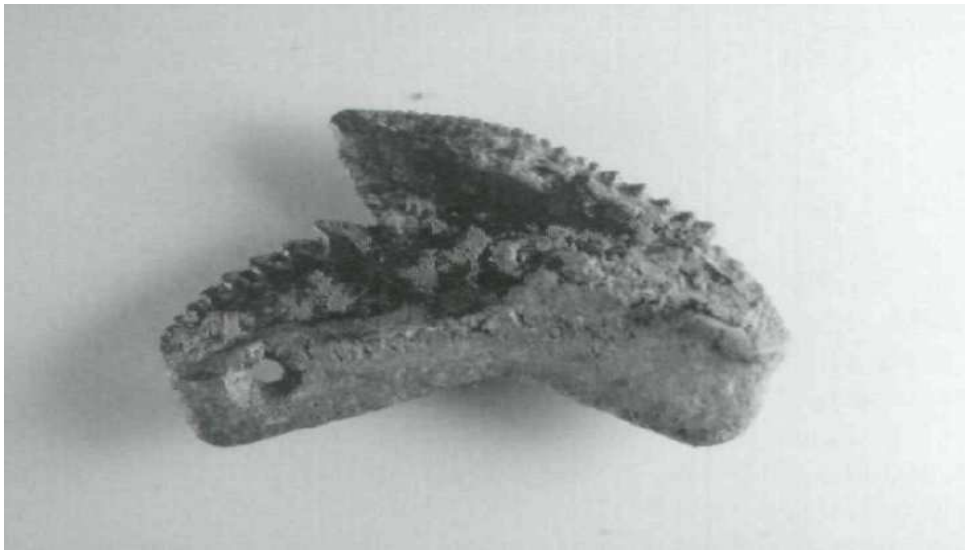
Dating method	AMS and Radiocarbon
View/Perception of Object	Originally the ochre stained limestone slab was attached to either the ceiling or wall of the rockshelter, as a ledge
Source of Raw Material	The limestone slab came from the ceiling or wall of the rockshelter. The composition of the ochre on the slab is different from that of the ochre recovered from the same stratigraphic level.
Mode of production	The ochre seems to have been applied by a method resulting in a thin even coating, possibly by blowing of wet pigment.
Microanalysis	Analysis shows the pigment on both sides is the same ochre, and furthermore is a single ochre.
Interpretations	The rock slab is limestone which is the parent material of the shelter, and is covered with deep red pigment on two sides and one edge, suggesting that it was painted while attached to the parent rock as a ledge: joined at the remaining unpainted edge. The Carpenters Gap find adds to a growing body of data for the systematic use of ochre in Australian sites as early as the earliest evidence for occupation. Carpenter's Gap is important as it is the oldest radiocarbon dated site in Australia.
References	O'Connor 1995; Flood, 1997; O'Connor and Fankhauser, 2001; Morwood, 2002

Cat 35. Painted rock fragment, Carpenter's Gap

Image: O'Connor, 1995

Catalogue No.	**36**
Site Name	Buang Merabak
Location of Site	New Ireland, Papua New Guinea
Date of Artefact	28,000 - 39,500 BP
Object Type	Shark's tooth
Dimensions	Maximum Length: 2.7 cm Height: 1.6 cm representing an animal about 4m long. The perforation is c. 2 mm in diameter
Description of object	The tooth and perforation are partially covered with calcium carbonate, obscuring the detail of aspects of the tooth's surface.
Material	The perforated tooth is from the mid-symphysis region of the mandible of a tiger shark, *Galeocerdo cuvier*. This species is known to frequent tropical reefs.
Type of site	Cave site
Environmental conditions	The site is adjacent to the coastal village of Konogusngus at the base of a series of Miocene limestone terraces that rise c. 1000m to the Lelet Plateau. The mouth of the Buang Merabak cave site is c. 150m above the present sea level and c. 200m from the coast. The Buang Merabak deposits do not contain basal sands reflecting deposition by wave action. There is no suggestion that the sea was ever near enough to the cave to have played a direct role in either cave development or the accumulation of deposits. Before about the last glacial maximum, the climate was one of higher absolute rainfall, slightly cooler temperatures, and lower evaporation rates than today. Sea levels fluctuated but were usually substantially lower than today, reaching ÿ130+10 m at 20,000 years BP.
Context	Excavated from area TPIB, equivalent to 170 cm below the current cave floor; units TP1A and TP1B contained a total of 14 shark teeth.
Description of context	Unit 4 represents the initial occupation of the site including the period from c. 39,500 BP to c. 28 000 BP. While Buang Merabak contains some evidence of vertical redistribution in the upper units, the lower units reflect good stratigraphic integrity. The identity of the shark tooth as an ornamental object from a context deposited between 39,500 and 28,000 years BP is thus proposed as reasonably secure.

Associated finds	This unit has a low density deposition of food refuse including marine shell, bat bone (primarily *Dobsonia anderseni*), fish bone and stone artefacts suggesting occupation by small highly mobile groups of hunter-gatherers who were exploiting both inland and coastal resources.
Date range of site	c.39,500 – 1800 BP - with various periods of hiatus
Dating method	
Source of Raw Material	Although teeth may be taken from a dead shark, in historic times at least the shark was an item of prey. Shark catching, or 'calling', was reported as early as AD 1643 in New Ireland (Ene & Minu 1974; Downie & White 1978; White et al. 1991: 54) and still occurs today. The shark callers work in pairs and put to sea in single log outrigger canoes. Their equipment consists of a dugout canoe rattle and a float attached to a rope tied into a lasso. Once the fishermen have left the reef and paddled into the open sea the rattle is shaken in the water to encourage the sharks to swim alongside the canoe. Then the lasso is hooked around the sharks head as it swims past. The float serves to sap the shark of energy. As the shark tires the float brings it to the surface and the fishermen are able to catch up with it. Once it has been drawn alongside the boat it is beaten over the head and eyes before being lifted into the boat for transport back to shore (Ene & Minu 1974).
Mode of production	The hole was produced by a point rotated in a 'drilling' motion alternating from side to side.
Interpretations	Whether these remains reflect the antiquity of the cult associated with 'shark calling' is difficult to explore; however, the presence of shark in the assemblage certainly reflects the extent of the marine familiarity of the prehistoric inhabitants, and even though tiger sharks are known to frequent both the shallow waters behind reefs and the open sea their capture is clearly a dangerous activity.
Current location	?
References	Leavesley 2007



Cat 36. Perforated shark's tooth, Buang Merabak

Image: Leavesley, 2004:312

Catalogue No.	**37**
Site Name	Mandu Mandu Rock Shelter
Location of Site	Cape Range peninsula, Western Australia.
Date of Artefact	35,200 ±1000 – 30,900 ±800 BP
Object Type	Perforated *Conus* shells
Dimensions	Diameters of the holes range between 2.5 and 3.7 mm; mean diameter is 3.2 mm. The largest of these predominantly intact shells has a maximum length of 21.1 mm and a maximum diameter of 12.4 mm.
Description of object	Perforated shells
Material	Marine shells of genus *Conus*
Type of site	Rockshelter
Environmental conditions	The back-bone of the peninsula is formed by Cape Range, an extremely rugged and largely inaccessible limestone range dissected by numerous intermittently flowing creeks. Its western coast is bordered by Ningaloo Reef, and on its eastern margin are the shallow and sheltered waters of Exmouth Gulf. Before about the last glacial maximum, the climate was one of higher absolute rainfall, slightly cooler temperatures, and lower evaporation rates than today. Sea levels fluctuated but were usually substantially lower than today, reaching c.130+10 m at 20,000 years BP.
Context	Twenty-two small cone (*Conus sp*.) shells and fragments were recovered from the basal occupational horizon in Square C1.
Description of context	22 *Conus sp*. shell beads from the basal occupation horizon at 32,000 BP [between 34,200 1,050 BP (Wk 1513) and 30,000 850 BP (Wk 1576)]; the deposit from which the *Conus* shells were recovered is some 20 cm below a date of 22,100 500 BP (Wk 1575); three cone shell fragments, one of which may be deliberately modified, recovered from deposits with an estimated age of 21,000 BP; fragment of either *Nautilus* or pearl oyster and scaphopod shell (*Dentaliidae sp*.) from late Pleistocene deposits, known ethnographically to have been used as ornaments, such as pendants. Found in close association with one another

Associated finds	Square C1, in the basal 9 cm of deposit, a marked abundance of archaeological material including over 75 g of marine shell, 140 g of bone and some 50 stone artefacts was recovered.
Date range of site	The dated sequence from this rock-shelter now spans from c. 32,000 BP to at least 430 BP, although the site appears not to have been occupied between 20,040 and 5490 BP, corresponding with the onset of the arid conditions of the last glacial period.
Dating method	Nine radiocarbon dates have now been obtained. All are conventional dates and, with the exception of one charcoal sample, all have derived from marine shell.
View/Perception of Object	It is estimated that if assembled, the strand of at least 22 beads would have had a length of 18 cm.
Source of Raw Material	All the shells show evident selection for size and genera. Their worn and battered appearance suggests they were probably collected as dead shells in the beach drift where they can often be found in abundance. Identification of the cones from this site is problematical as they have very worn and etched surfaces. They are provisionally identified as *Conus dorreensis* a species which typically lives in shallow waters on reef platforms, and in sand under rocks, environments consistent with the predominantly reefed shoreline of the western coast of the Cape Range peninsula. Cone shells, with over 300 known species, belong to one of the most diverse shell families in Australian waters. Though edible, many are venomous and they are not generally considered to be a dietary species. In view of the condition and very small size of the cone shells described here, it is considered most unlikely that they were collected for human consumption.
Mode of production	It is suggested that the beads were made by rubbing the weakest part of the shell, the apex, against an abrasive surface. Once a rough hole had been worn, the internal structure would then be broken, perhaps using a piece of bone or stick. The edge of the top hole would be rounded and the still largely intact shell threaded on a fine string. The shell rings appear to represent a secondary modification following breakage of the last whorl, whether accidental or deliberate, during modification.
Microanalysis	The two best-preserved cones have a small notch worn into the shell edge at the posterior end of their aperture. In some species of cone a notch occurs naturally in this position. However, inspection of these notches under magnification

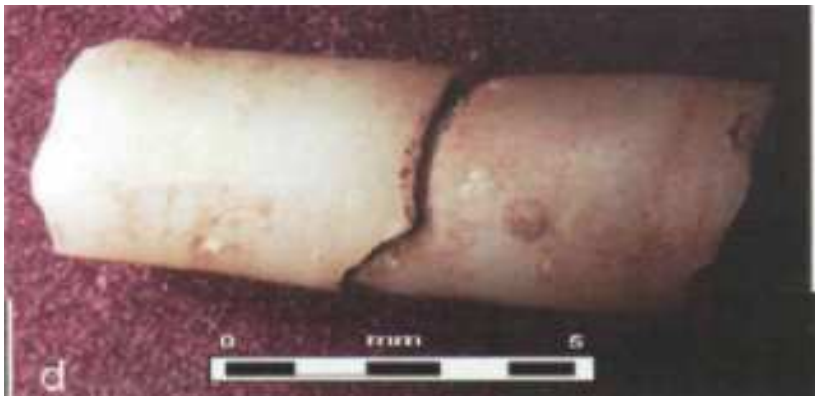
	(400x) showed that they had very abraded edges. This is consistent with the notch being formed by wear from a string on which the beads could have been threaded. A string inserted in the hole in the apex is most likely to emerge from the shell at the posterior end of the aperture, thereby eventually causing a notch to form. Growth lines, visible at high magnification on the shell's surface, appear to have been cut through by the notches. Comparison of notches on the *Conus sp.* material with similarly threaded shell artefacts from north Western Australia, held in ethnographic collections at the Western Australian Museum, show analogous wear patterns.
Interpretations	The shell beads described here extend the age of human use of decorative ornaments in Australia to a time comparable with some of the earliest such evidence from Europe.
Current location	Western Australian Museum
References	Morse, 1993.

Cat 37. Perforated *Conus* shells, Mandu Mandu Rockshelter

Image: White, 2003

Catalogue No.	**38**
Site Name	Riwi Cave
Location of Site	The Kimberley, Western Australia
Date of Artefact	30,000 BP
Object Type	*Dentalium* shells
Dimensions	The 10 Dentalium shell beads from Riwi Cave range in length from 0.52–1.75 cm, with a mean of 1.25 cm
Description of object	Perforated marine shell showing residue of blood and fibre.
Material	All are fragments of tusk shells belonging to the order *Dentaliidae* but, as none of the fragments include the posterior part of the shell, it is not possible to further classify the shells beyond saying that they could represent eight species within the families *Dentaliidae, Fustiariidae* and *Laevidentaliidae.*
Type of site	Cave site
Environmental conditions	Before about the last glacial maximum, the climate was one of higher absolute rainfall, slightly cooler temperatures, and lower evaporation rates than today. Sea levels fluctuated but were usually substantially lower than today, reaching 130+10 m at 20,000 years BP.
Context	Recovered from stratigraphic units iii, iv, v & vi
Description of context	
Associated finds	Associated archaeological material includes stone artefacts, ochre, bone and freshwater mussel shell.
Date range of site	
Dating method	Radiocarbon dating
Source of Raw Material	Although scaphopods are sub-tidal they are frequently found as empty shells on the coast and wash up on the shore in huge numbers following tropical storms. Riwi is currently 300 km inland and, 30,000 years ago would have been at least 500 km from the nearest sea. Such inland finds are not isolated in the Kimberley.
Mode of production	A study of *dentalium* breakage by Vanhaeren and d'Errico (2003) has shown that different manufacturing techniques result in different characteristics to the fractured end of the shell. Openings on unbroken dentalium have regular edges

	and the posterior ends are thin and sharp. Fractured *dentalium* has irregular edges created by micro chipping. Fractures are either perpendicular or oblique to the main axis of the fragment and often have a lip-like morphology. Sawing produces ends with two facets. One is oblique and covered with traces left by the to-and-fro movement of the cutting edge. The break resulting from sawing leaves a facet perpendicular to the main axis that is morphologically similar to the one produced by snapped shell. The fractured ends on the beads from Riwi display a variety of morphologies including straight fractures, notched fractures and undulations. These combinations indicate that the beads were produced by a combination of snapping and cutting. It is possible that some shells produced more than one bead.
Microanalysis	Under a microscope x 50 the residue is dark red/black. A Hemastix test on two of these residue patches yielded positive 'small' results suggesting that there may be some blood in the residue. A fibre fragment was observed on the end of one the beads
Interpretations	Dentalium shell was transported from the coast as value goods. They may have been traded commodities resulting from indirect ‘‘down-the-line’’ exchange.
Current location	?
References	Balme and Morse, 2006; Habgood & Franklin, 2008



Cat 38. *Dentalium* shell, Riwi Cave

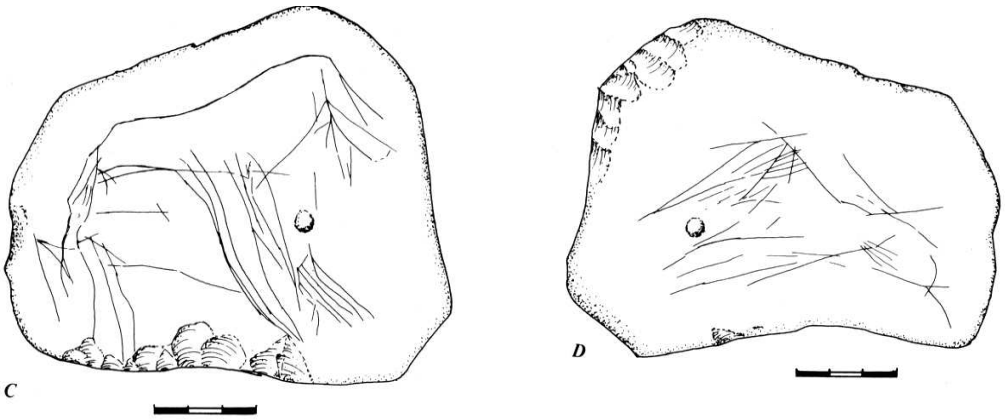
Image: Balme and Morse, 2006

Catalogue No.	**39a and 39b**
Site Name	Hayonim Cave
Location of Site	Western Galilee, Israel
Date of Artefact	27,000 – 29,000 BP
Object Type	Two Incised limestone slabs
Dimensions	Approx. 10cm x 10cm
Description of object	The image on the first limestone slab is the most clear and is the only image described here. On side 1, a line resembles an ungulate, with some indication of a head. The lines descending on the right edge do not outline a pronounced 'horse' head, but the line of the front and the ventral seem quite clear. Many lines give the impression of forelegs and rear legs. Side 2 presents fewer incised lines and suggests "some sort of a back (in a diagonal direction) and a series of descending lines". The horse has no hooves, no facial features and no underbelly, the back is "merely an undifferentiated arc", and the eye a simple gash. The horse was engraved first followed by a series of lines overlaying the image.
Material	Limestone fragments
Type of site	Cave site
Environmental conditions	There is no major difference between the raw material used by the Aurignacians and the later Natufians. Both exploited the bones of their game. Most of the tools were manufactured from gazelle limb bones, gazelle horn cores and deer antlers.
Context	The two slabs were found in two locations: D1-2 (Sq.J21) and D4 (Sq.121)
Description of context	Layer D is a light coloured greyish loam, 0.35 – 0.45 cm thick with scattered limestone fragments, brought-in cobbles, hearths and numerous bones. The excavation of layer D was carried out over an area of 15m² on metre square units. Each metre square was further subdivided into four quadrants. 65.2% of the flint tools of layer D were recorded in situ as well as all the limestone, basalt, and bone artefacts. All the sediment was wet-sieved in 1.5 mm mesh, and then hand-sorted.

Associated finds	In addition, present in the Aurignacian levels at Hayonim are five bead types (red deer, fox and wolf canines, horse and deer incisors); the teeth were polished after the removal of enamel.
Date range of site	The site has several layers of occupation, the most substantial of which are Middle Palaeolithic (Mousterian) occupations, dated between 100,000 and 250,000 years ago and a Natufian occupation about 12,000 years ago.
Dating method	Radiocarbon
View/Perception of Object	3D
Source of Raw Material	Local
Mode of production	Carved / Incised on rock
Microanalysis	The images here are not clear and would have required microanalysis.
Interpretations	The engraved horse overlain by a series of lines has been interpreted by Marshack, who suggests it represents the symbolic ‘killing’ of the animal.
Current location	
References	Marshack, 1997; Belfer-Cohen & Bar-Yosef, 1981; Bar-Yosef, 1997

A

B



Cat 39. Incised Slabs, Hayonim Cave

Image: Photos and drawings of the incised small slab from Stratum D.
A and B: Dorsal face
C and D: Ventral face

Image: Marshack, 1997