Palaeolithic ivory sculptures from southwestern Germany and the origins of figurative art

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Archaeologists have always viewed the origin of figurative art as a crucial threshold in human evolution[1,2]. Here I report the discovery of three figurines carved from mammoth ivory at Hohle Fels Cave in the Swabian Jura of southwestern Germany, which provides new evidence for the appearance of figurative art more than 30,000 years ago. The finds include the oldest known representation of a bird, a therianthropic sculpture and an animal that most closely resembles a horse. The Aurignacian sculptures of the Swabian Jura belong to one of the oldest traditions of figurative art known worldwide and point to the Upper Danube as an important centre of cultural innovation during the early Upper Palaeolithic period[3,4].

Hohle Fels is located in the Ach Valley near the town of Schelklingen, 20 km southwest of Ulm. After many years of excavation in the rich Magdalenian and Gravettian deposits, in 1999 the excavation team reached the Aurignacian strata[4]. There, along with a wealth of lithic and organic artefacts, three figurines of mammoth ivory have been recovered (Figs 1 and 2). These figurines complement the assemblages of ivory sculptures found in Aurignacian cave deposits at the Swabian sites of Vogelherd, Hohlenstein-Stadel and Geißenklösterle (ref. 3 and Table 1).

Figurine 1 depicts the head of an animal that is most probably a horse, although it could perhaps represent a bear or another animal. The main piece was found in 1999 in the transition between archaeological horizons (AH) IId and IIe, and it fits to a piece of the animal's cheek from the underlying AH IIIa. The sides of the face and underside of the jaw show fine, regular cross hatching and fine parallel lines. The mandibular morphology is accentuated by a line along the base of the jaw, and the mouth, nostrils and eyes of the animal are depicted with deeply incised lines.

The body of the Figurine 2 was recovered in 2001 from AH IV near the bottom of the Aurignacian sequence. In 2002 the head and neck of the figurine were recovered from AH IV and confirm that the sculpture depicts a water bird with a morphology similar to that of a diver, cormorant or duck. This figurine has dimensions of 47 × 13 × 9 mm. The extended neck of the bird is strongly suggestive of a waterfowl in flight or diving. The wings are depicted close to the body. As compared with many finely carved figurines of the Swabian Aurignacian, the front of the bird has been left in a seemingly unfinished state. The other parts of the bird are presented in greater detail. Both eyes are easily recognizable, and the beak has a conical, pointy form that one would not expect on many of the common ducks. The legs of the bird are short with no indications of feet. The tail of the figurine extends below the legs and is depicted as a finely carved flat splint. The back of the bird shows a series of distinct lines that apparently represents feathers.

Figurine 3 stands only 25.5 mm high and was recovered in 2002 from AH IV. The figurine is a longitudinal fragment of the head, torso, arm, shoulder and buttocks of an upright therianthropic representation, showing marked similarities to the *Löwenmensch* from Hohlenstein-Stadel. The shoulder is angular and the posture rigid. A delicately carved ear is visible high on the head. The arm is short and pointy with an incised vertical line. The main features depict a mixture of felid and human traits. The preservation of the piece allows no conclusions to be drawn about the sexual attribution of the figurine.

The horse head is slightly older than 30,000 years (30 kyr), the figurines from AH IV date to 31–33 kyr, and the deepest Aurignacian deposit, AH Va, which immediately underlies AH IV, has yielded dates between 33 and 36 kyr (Table 2). Radiocarbon dates for the period before 30 kyr are likely to be underestimates of calendar ages[4–7]. Because there is no reliable, high-resolution radiocarbon calibration for this period, the precise ages of the Swabian ivory artworks are not known.

Archaeological horizon IV is the richest of the Aurignacian deposits at Hohle Fels and, although only 9 m^2 have been excavated, 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. Whereas the setting of the discovery of the original *Löwenmensch* deep in the cave of Hohlenstein-Stadel has been argued to be a cache or cult site[3,8], Vogelherd, Geißenklösterle and Hohle Fels, on the basis of the size and content

Figure 1 Views of the three ivory figurines from Hohle Fels, depicting the head of a horse (**a**), a water bird (**b**) and a therianthrope with the characteristics of a felid and human (**c**). Scale bars, 5 cm (**a**, **b**); 2 cm (**c**). Photos H. Jensen, copyright University of Tübingen.

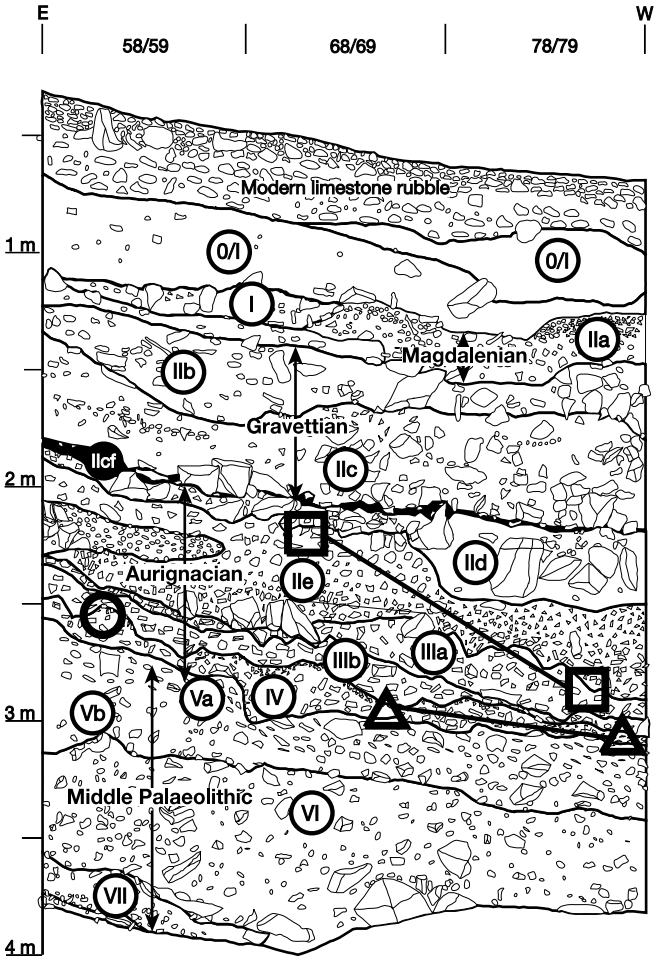

Figure 2 Stratigraphic provenience of the three Hohle Fels figurines. The horse head and bird comprise two refitted pieces. Triangle, bird; circle, therianthrope; square, horse head.

of their assemblages, represent substantial habitation sites. 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[9]. Some of these horizons have produced hundreds of pieces of debris from ivory working.

Over the years there has been considerable debate and speculation about the meaning of these figurines. Riek, for example, emphasized the importance of palaeoecology and hunting magic[10], whereas Hahn, in his thesis "*Kraft und Aggression*", argued that the Aurignacian inhabitants of the region mainly depicted strong, fast and dangerous animals[3]. Lewis-Williams, Porr and others have stressed the importance of mixed representations of animals and humans as evidence for shamanism[2,11].

The new figurines place some constraints on the existing range of interpretations. Although the discovery of another horse and a *Löwenmensch* may be viewed as consistent with the *Kraft und Aggression* hypothesis, the waterfowl from Hohle Fels is not consistent with this interpretation. One increasingly gains the impression that the Swabian Aurignacian figurines, while emphasizing predators as well as large, strong and fast animals, also depict a broad range of animals that the occupants of the region presumably admired.

Particularly illuminating is the discovery of a second *Löwenmensch*. The occupants of Hohle Fels in the Ach Valley and Hohlenstein-Stadel in the Lone Valley must have been members of the same cultural group and shared beliefs and practices connected with therianthropic images of felids and humans. These figures span the complete range of sizes for the carved ivory depictions. Whereas the original find is 30 cm high and originally weighed about 750 g, the find from Hohle Fels originally stood less than 4 cm high and weighed only a few grams. The discovery of a second *Löwenmensch* lends support to the hypothesis that Aurignacian people practised a form of shamanism.

The ivory figurines from Swabia represent one of the earliest artistic traditions worldwide. In Africa, the earliest evidence for figurative representations is the mobile rock art from late MSA contexts at Apollo 11 in southwestern Namibia, which dates to between 25.5 and 27.5 kyr (ref. 12). These paintings depict animals and a possible therianthrope. At Fumane Cave in northern Italy, preliminary information indicates that paintings including representations in red pigments of a therianthrope and several animals have been found in Aurignacian contexts predating 30 kyr (ref. 13). In Asturias in northern Spain at the site of Candamo, controversial claims for wall paintings have been made for the period around 32 kyr (refs 14, 15). In southwestern France at Abri Cellier, La Ferrassie, Abri Blanchard and Abri Castanet, there is evidence for engravings and paintings including representations of vulvas and animals dating to ~30 kyr (ref. 1). In Stratzing in Lower Austria, a small human figurine of stone has been recovered from Aurignacian contexts dating between 30 and 32 kyr (ref. 16).

The most spectacular evidence for early figurative artwork out-

Table 1 **Ivory figurines from the Aurignacian of the Swabian Jura**

Site	Figurine	Archaeological horizons	Date ^{14}C (kyr)	Date TL (kyr)	Excavation, date
Hohle Fels	Horse	IId/IIe–IIIa	30–31		Conard, Uerpmann 1999
	Bird	IV	31–33		Conard, Uerpmann 2001 and 2002
	'*Löwenmensch*'	IV	31–33		Conard, Uerpmann 2002
Geißenklösterle	Mammoth	IIa	30–34	~37	Hahn 1974
	Bear	IIa	30–34	~37	Hahn 1974 and 1977
	Anthropomorphic relief	IIb	30–34	~37	Hahn 1979
	Bovid	IIb	30–34	~37	Hahn 1983
Hohlenstein-Stadel	'*Löwenmensch*'	20 m, spit 6	31–32		Wetzel, Völzing 1939
Vogelherd	Anthropomorph	IV	~30–32		Riek 1931
	Felid	IV	~30–32		Riek 1931
	Bovid	IV	~30–32		Riek 1931
	Mammoth	V	30–36		Riek 1931
	Mammoth	V	30–36		Riek 1931
	Horse	V	30–36		Riek 1931
	Felid	V	30–36		Riek 1931
	Felid	V	30–36		Riek 1931
	Unidentified quadruped	V	30–36		Riek 1931
	Felid	Backdirt	–		Weber 1952, Scheer before 1971

Several artworks that are not figurative representations in ivory are not included in the table.

Table 2 **AMS radiocarbon dates from Gravettian and Aurignacian deposits at Hohle Fels***

Laboratory number	Archaeological horizons	Material	Modification	Date (years)	Cultural group
OxA-4599	IIc	Reindeer antler	Tool (decorated adze)	28,920 ± 400	Gravettian
OxA-5007	IIc	Reindeer antler	Tool (decorated adze)	29,550 ± 650	Gravettian
KIA 3503	IIcf	Bone		27,030 + 250 − 240	Gravettian
KIA 17742	IIcf	Horse tibia	Impact + cut marks	27,690 ± 140	Gravettian
KIA 17743	IIcf	Cave bear vertebra	With flint point	27,830 + 150/−140	Gravettian
KIA 17744	IIcf	Mammoth/rhino rib	Point	27,780 ± 150	Gravettian
KIA 17741	IIcf	Reindeer antler		27,970 ± 140	Gravettian
KIA 8964	IId (base)	Mammoth/rhino rib		29,560 + 240/−230	Aurignacian
KIA 8965	IId (base)	Reindeer antler		30,010 ± 220	Aurignacian
KIA 16040	IIe	Horse pelvis	Impact + cut marks	30,640 ± 190	Aurignacian
KIA 16038	IIIa	Reindeer femur	Impact + cut marks	29,840 ± 210	Aurignacian
KIA 18877	IIIa	*Pinus* charcoal		30,170 + 250/−240	Aurignacian
OxA-4601	IIIa	Bone		30,550 ± 550	Aurignacian
KIA 18876	IIIa	*Pinus* charcoal		31,010 + 600/−560	Aurignacian
KIA 16039	IIIa	Small ungulate femur	Impact	31,140 + 250/−240	Aurignacian
KIA 18878	IIIb	*Pinus* charcoal		29,780 + 330/−310	Aurignacian
OxA-4600	IV	Reindeer metapodial		31,100 ± 600	Aurignacian
KIA 18879	IV	Unidentified charcoal		31,160 + 1,530/−1280	Aurignacian
KIA 16036	IV	Horse femur	Tool (retoucher)	33,090 + 260/−250	Aurignacian
KIA 16035	Va	Horse bone	Impact	33,290 ± 270	Aurignacian
KIA 18880	Va	*Pinus* charcoal		34,190 + 340/−330	Aurignacian
KIA 16034	Va	Small ungulate humerus	Impact + cut marks	35,710 + 360/−340	Aurignacien

*AMS, accelerator mass spectrometry.

side Swabia comes from Grotte Chauvet in the Ardèche region of southern France, where rock paintings have been published dating as far back as 32 kyr (refs 15,17–19). Debate continues on the antiquity of the paintings from Grotte Chauvet, and similarities between the subject matter depicted at Chauvet and in the Swabian Aurignacian have been taken as evidence for their antiquity. Fully symbolic communication and cultural modernity may well have existed earlier in other regions, but nowhere is the concrete evidence for cultural modernity in the form of numerous figurative depictions combined with the regular manufacture and use of ornaments and the presence of musical instruments demonstrated earlier than in Swabia[4].

Because most Aurignacian deposits have produced no diagnostic human remains, there is no proof as to which hominid created these assemblages[20]. If, however, one assumes that modern humans produced these assemblages, the Aurignacian of Swabia suggests an early migration of modern humans along the Danube Corridor into the interior of the continent[4]. The Aurignacian appears suddenly in Swabia, and nowhere in Swabia is an interstratification of Middle Palaeolithic and Aurignacian assemblages documented. At several key sites an occupational hiatus is recorded in the strata below the Aurignacian. The "population vacuum" hypothesis[4,21] postulates that modern humans migrated via the Danube Corridor into Swabia immediately after a cold arid period, most probably the terrestrial equivalent of the Heinrich 4 event dating to ~38–40 kyr (refs 22, 23). This harsh climatic phase ended suddenly with the start of Dansgaard–Oeschger cycle IS 8, which dates to roughly 38 kyr. This could explain why modern humans apparently arrived in an empty or largely depopulated region. Early Upper Palaeolithic migrations of modern humans also occurred along the Mediterranean coast and other routes. Innovations spread rapidly and regional variation ensued[24,25]. The Swabian Jura preserves outstanding evidence for the early Aurignacian, and is one of several key areas of cultural florescence at the beginning of the Upper Palaeolithic. □

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