

# Pavlov VI: an Upper Palaeolithic living unit

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*This newly discovered and excavated site defines an Upper Palaeolithic activity unit consisting of a roasting pit at the centre of an area 5m across. Although the main task was the processing of two mammoths, there were numerous other wild animals in the assemblage. The occupants used flint knives, made bone tools and modelled in baked clay – on which they left their fingerprints, along with imprints of reindeer hair and textiles. Pavlov VI offers an exemplary picture of the basic living unit that made up the settlement clusters of the Gravettian people in Central Europe.*

*Keywords:* Czech Republic, Danube, Upper Palaeolithic, Gravettian, settlement, mammoth, baked clay models

## Introduction

One of the characteristics of the Danubian Gravettian (Pavlovian) period is that its sites are found in clusters (Gamble 1999; Roebroeks *et al.* 2000; Svoboda & Sedláčková 2004). These may be intensive occupations, resulting from repeated human activities at one place, (for example the Dolní Věstonice I and Pavlov I sites) or extensive spreads of individual occupations over a wide area (for example Dolní Věstonice II). In each case the sites are composed of individual settlement units, consisting of a central hearth surrounded by various pits, large bones and artefact scatters.

Among the best explored examples are the sites in the Dolní Věstonice-Pavlov area in the Czech Republic (Svoboda 1994, 1997, 2005) where individual sites may also show a hierarchy of importance and size. This paper reports a new single-occupation site located about 1km east of Pavlov I and named Pavlov VI (Figures 1 and 2). Pavlov VI has clear stratigraphy, radiocarbon dates, several pits, faunal and floral remains, transported rocks and tertiary shells, stone and bone artefacts, decorative items and ochre. It has also produced

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Figure 1. Location of Pavlov and Dolní Věstonice, Czech Republic.

12 pieces of ceramics, including some with zoomorphic forms and some with the impressions of human epidermal ridges, animal hair and textile structures.

### Stratigraphy and $^{14}\text{C}$ dating

Pavlov VI was discovered on 27 June 2007, when a canal ditch being dug between the villages of Milovice and Pavlov cut a dark lens of humic sediments 4–5m long at an altitude of 205m asl (a typical location for all Pavlovian sites in the area). The cultural layer was deposited below 0.8m of arable soil and 0.6–0.7m of light calcareous loess (with microlayers of loess loams redeposited by gelifluction). It took the form of a lens with a maximum thickness of 0.35m made of humic calcareous silt, with limonitic bands containing charcoal and artefacts. It lay on silty subsoil 0.5m deep which was calcareous and contained charcoal but no anthropogenic material. Below this lay the gravels of the Dyje River.

Four samples for radiocarbon dating were collected at regular depth intervals from within the thick cultural layer, but the uppermost and lowermost ones failed to produce reliable dates due to low carbon content. The two dates from the middle of the layer are  $25950 \pm 110$  BP (GrA-37627) and  $26110 \pm 130$  BP (GrA-37628). Their calibrated ages using the CalPal-2007 Hulu data set and CalPal program (Weninger & Jöris 2004; Weninger *et al.* 2007) are  $28930 \pm 270$  cal BC and  $29070 \pm 270$  cal BC. These two dates fit well into a larger series of 11 dates from the nearby large site of Pavlov I (Svoboda 2005: Table 1).



*Figure 2. Pavlov VI, general view of the site and excavation as a part of the south Moravian landscape. The view is taken from the mountain ridge towards the Dyje River floodplain.*

## **The spatial distribution of remains**

A  $5 \times 3$  m area of the cultural layer was uncovered in the southern part of the opened area, separated into 1 m squares numbered A-E and 1-3 (Figure 3). All of the recovered sediments were wet-sieved. The nearby control trenches did not show a continuation of the cultural layer. The horizontal distribution of the artefacts (Figure 3) demonstrates that the site was produced by a unique, spatially isolated settlement unit with a diameter of 4-5 m.

An oval-shaped pit measuring  $1.2 \times 0.8$  m, and 0.35 m deep, was located in the centre. The shape of this depression, originally regular, was slightly deformed by post-depositional slope movement of the overlying layers. It was filled with dark humic sediments, rich in charcoal pieces and fragments, burnt stones and their fragments, and smaller bone fragments. The central pit was surrounded by several adjacent smaller pits, 0.15-0.25 m in diameter and about 0.15 m deep. Their infill was either identical to that of the central hearth or was a browner version. The central pit and the surrounding pits were probably used to prepare food. We interpret the smaller pits as boiling pits. Analogous features, and in similar associations, were noted at Pavlov I, Dolní Věstonice II, as well as at the north Bohemian Mesolithic sites (Svoboda *et al.* 2007).

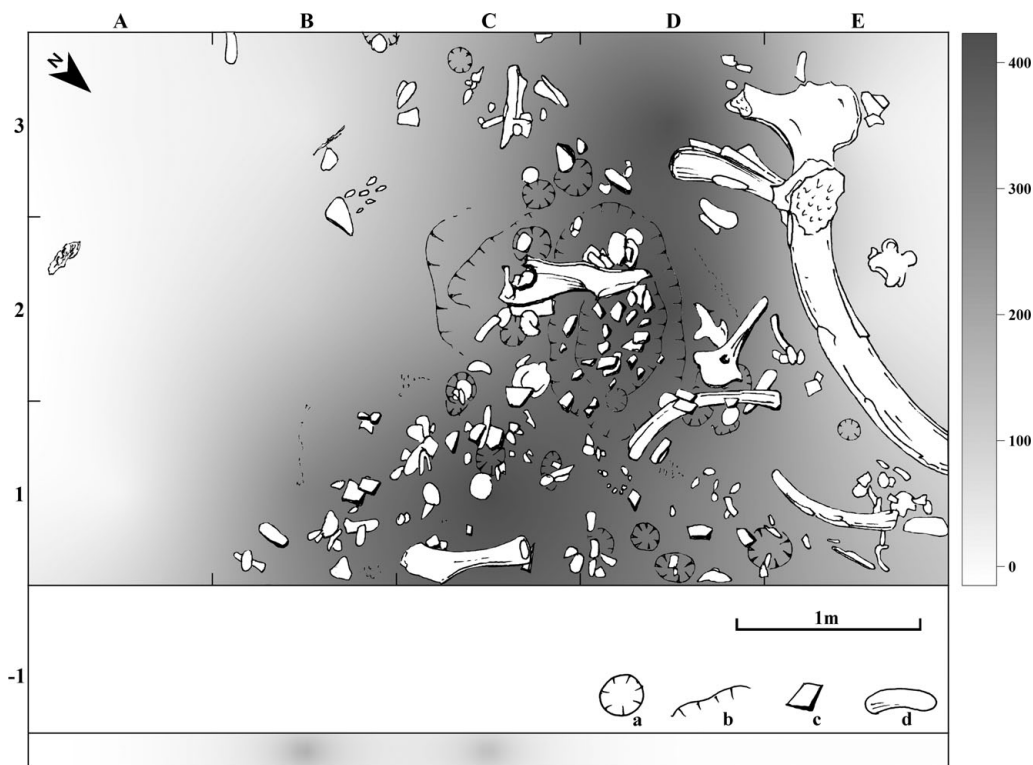


Figure 3. Plan of the excavated area showing the distribution of larger bones (d), stones (c), depression features (a-b) and spatial distribution of three-dimensionally recorded artefacts. Pits filled with charcoal and burnt stones lies in the centre, to the left and in front are boiling pits, to the right mammoth tusks and bones.

An accumulation of mammoth bones lay in the western portion of the excavated area. It included the remains of two individuals, an adult female and a calf. The remains included a large tusk more than 2m long, 2 smaller tusks (0.7-0.8m), pelvis, vertebrae and ribs. Smaller bones were scattered through the area. Evidence of human actions are visible on the mammoth bones and include a perforation on a mammoth long bone (Figure 4) as well as a flint artefact inserted into a tusk.

## Flora and fauna

Charcoal fragments were frequent over the entire area of the site and concentrated in the fillings of pits. All the analysed samples were dominated by spruce (*Picea abies*), followed by larch (*Larix decidua*). Pine is represented by only three fragments (*Pinus sylvestris*, square C2) and oak by a single fragment (*Quercus* sp., square D2). The dominance of conifers and the presence of a few more deciduous species is in accordance with the previous palaeobotanical analyses from the Dolní Věstonice-Pavlov area (Opravil 1994). Shell fragments of Quaternary terrestrial gastropods *Succinea oblonga*, *Cepaea* sp., and *Euomphalia strigella* complete the reconstruction of local environment.



Figure 4. Mammoth bone with a chipped-off perforation.

A rich faunal inventory totalling 5334 items was recovered from Pavlov VI. Of these, 3139 items are undeterminable (59 per cent of the total bone counts) and 1047 items were burnt (20 per cent of the total bone number). The majority of the identified bones belong to mammoth (*Mammuthus primigenius*, 70 per cent), followed by a category of large mammal (horse or bovid in size, 9 per cent), and middle-sized mammals (reindeer or wolf in size, 6 per cent) and wolf (*Canis lupus*, 6 per cent). Horse and reindeer remains are less frequent (*Equus germanicus*, 3 per cent; *Rangifer tarandus*, 3 per cent). The remains of small mammals are rare (fox or hare in size, 1 per cent) as do those of the arctic fox (*Vulpes lagopus*, 1 per cent). Singular remains belong to the wolverine (*Gulo gulo*, 0.2 per cent), bear (*Ursus* sp., 0.1 per cent) and hare (*Lepus* sp., 0.1 per cent).

Mammoths are represented by two individuals, one of them an adult between 20 and 25 years of age and one a calf between 2 and 5 years of age. Based on the size of the tusk, the adult was a female, and the calf most probably was hers. The other species are represented by single individuals. Almost all parts of the skeleton were recorded for the mammoths, horse, reindeer, wolf and arctic fox. The mammoths most probably were hunted in the immediate vicinity, while the smaller animals were transported to the site for processing. The bear is represented by a single phalange, and this might indicate hide processing.

A part of the bones were covered by red ochre for undetermined ritual or quotidian reasons. One mammoth bone fragment was also covered by bitumen. The presence of reindeer or reindeer skins at this site is also indicated by the impressions of reindeer hair on clay fragments (see below).

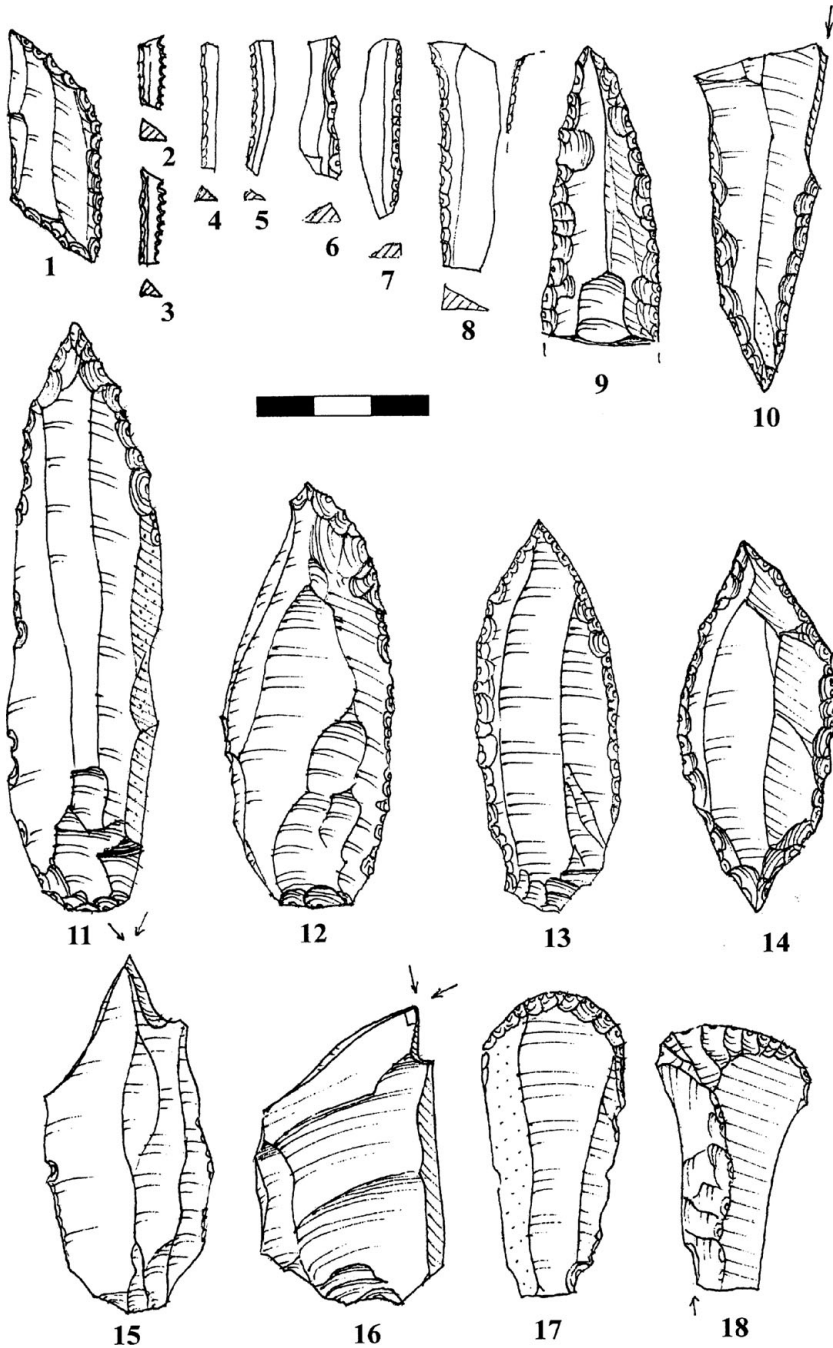
## Use of cobbles and shells

Cobble stones from the vicinity were found in the central pit and are seen as intentionally brought to the site for the purpose of roasting food. There were 135 complete specimens and 48 fragments of molluscs, dominated by scaphopods and gastropods, while the bivalves are represented by two small fragments only. Also from the vicinity, they included the most numerous remains of scaphopods (species *Dentalium badense*, as well as species of the gastropods *Pirenella*, *Melanopsis*, *Turritella*, *Conus*, and *Terebralia*). As at the other sites in this area (e.g. Pavlov I and Dolní Věstonice, see Hladilová 1994, 1997, 2005), these species were collected as fossils originating from the Miocene sediments of the Carpathian Foredeep and of the Vienna Basin – both located not far from the site. The surfaces of most of the shells were heavily weathered. Human modification included artificial perforations, cutmarks, and remains of red coloration or black charcoal.

## The artefacts: stone and bone industry, decorative items and ochre

The lithic industry is made of various types of flint, partly burnt if located in the vicinity of the hearths. Although the whole content of the cultural layer was wet-screened, the group of microliths is surprisingly small (compared to the other recently excavated and wet-screened or floated Gravettian/Pavlovian materials): a marginally retouched geometric microlith (Figure 5: 1), microblades, backed bladelets and backed microsaws (Figure 5: 2-8). Pointed blades are distinctive at this site (Figure 5: 9-14). The quantitative dominance of burins (Figure 5: 10, 15-16) over endscrapers (Figure 5: 17-18) is not as important as in other Gravettian assemblages. Within the Gravettian chrono-typological framework (Svoboda 1994: 215), Pavlov VI falls into the Evolved Pavlovian stage, and into the facies or style characterised by intensive marginal retouching on flakes, blades and pointed blades and by the presence of a few microliths belonging to the so-called Předmostí style. A discussion whether this facies of the Pavlovian reflects function or style lies outside of the scope of this paper. The recovered assemblage also contains a heavy duty industry, especially hammerstones and stone plaques.

The organic inventory includes two spatulae-shaped artefacts made of mammoth ribs, which fall into the category of bevelled tools (Figure 6). Preliminary results from technological analysis indicate the following production sequence or techno-economic schema (Averbouh 2001): the support was produced by longitudinal splitting of the rib, most probably using a wedge, which left traces on the lateral edges of one of the implements. Traces of sawing or grooving were not observed due to weathering damage. At the stage of shaping, the distal part of one of the artefacts has been ground, but traces of the grinding were worn during later use. Finally, negatives from impacts and other deformations observed at the proximal and distal parts indicate a reutilisation of both tools as intermediates.



*Figure 5. Selection of the lithic industry.*

Decorative items are represented by four perforated flat pebbles, some of which are decorated by short incisions in various directions (Figure 7), a perforated tooth of an arctic fox, and by some of the above-mentioned perforated shells of Tertiary molluscs. The ochre



Figure 6. Bone spatula.



Figure 7. Perforated decorative pebbles.

inventory includes sharp-edged fragments of hematite of grey-to-violet coloration and a steel-like polish, and earthy pellets, red-to-ochre in colour. Traces of ochre are also visible on some of the other artefacts recovered (a stone plaque, back of a bladelet, a pierced pebble, etc.).

### Ceramic pieces and fragments

Ceramic pieces depicting a variety of zoomorphic and anthropomorphic shapes as well as fragments of fired clay are an important component of Pavlovian cultural inventories. Their discovery at a number of the sites in southern Moravia dates back to the 1920s (Bayer 1924; Absolon 1945; Klíma 1979, 1989; Vandiver *et al.* 1989, 1990; Bougard 2007). Subsequently,



imprints of organic materials were noticed on the pellets, and these provided important information on dermatoglyphics (Vlček 1951; Králík *et al.* 2002; Králík & Novotný 2005) and textile and cordage (Adovasio *et al.* 1996, 1999). The newly discovered 12 fragments of burnt clay recovered at Pavlov VI augment and expand the earlier evidence.

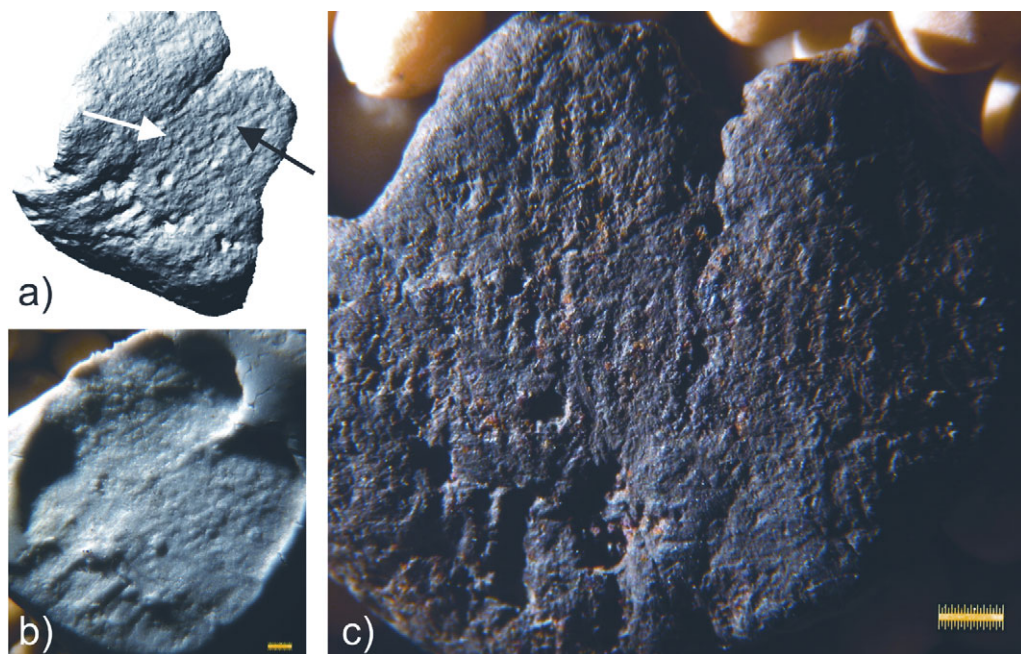


*Figure 8. Ceramic fragment showing the head and neck of a carnivore (lion?); the other face was completely destroyed by a deep frontal incision.*

Twelve ceramic fragments and pellets were obtained during the wet-sieving of the sediments. The items show a range of firing temperatures and, as a result, variable quality and preservation. We recognised intentionally modelled shapes as well as imprints of human epidermal ridges, of animal hair and of textile structures. The yellowish-to-greyish colouration suggests that the majority (9 pieces) were produced in oxidation environments, and only 3 pieces, all of which were found around the central pit, in reduction environments, most probably inside the pit. This contrasts

to the results from other Pavlovian sites in the area where reduction environments dominate (cf. Soffer & Vandiver 1997). One of the pellets bears traces of a bitumen surface.

Among the modelled shapes, the most recognisable piece depicts the head and neck of a carnivore which, by comparison to the zoomorphic shapes from Dolní Věstonice-Pavlov,



*Figure 9. Pavlov VI: an imprint of human epidermal ridges on a dark ceramic object: a) 3D surface model; b) plasticine cast; c) original. Scale (b, c) = 1mm. Positions of possible minutiae are labelled with arrows (a).*



Figure 10. Pavlov VI: an imprint of crossed linear structures on the side of a ceramic object: a) original; b) plasticine casts.

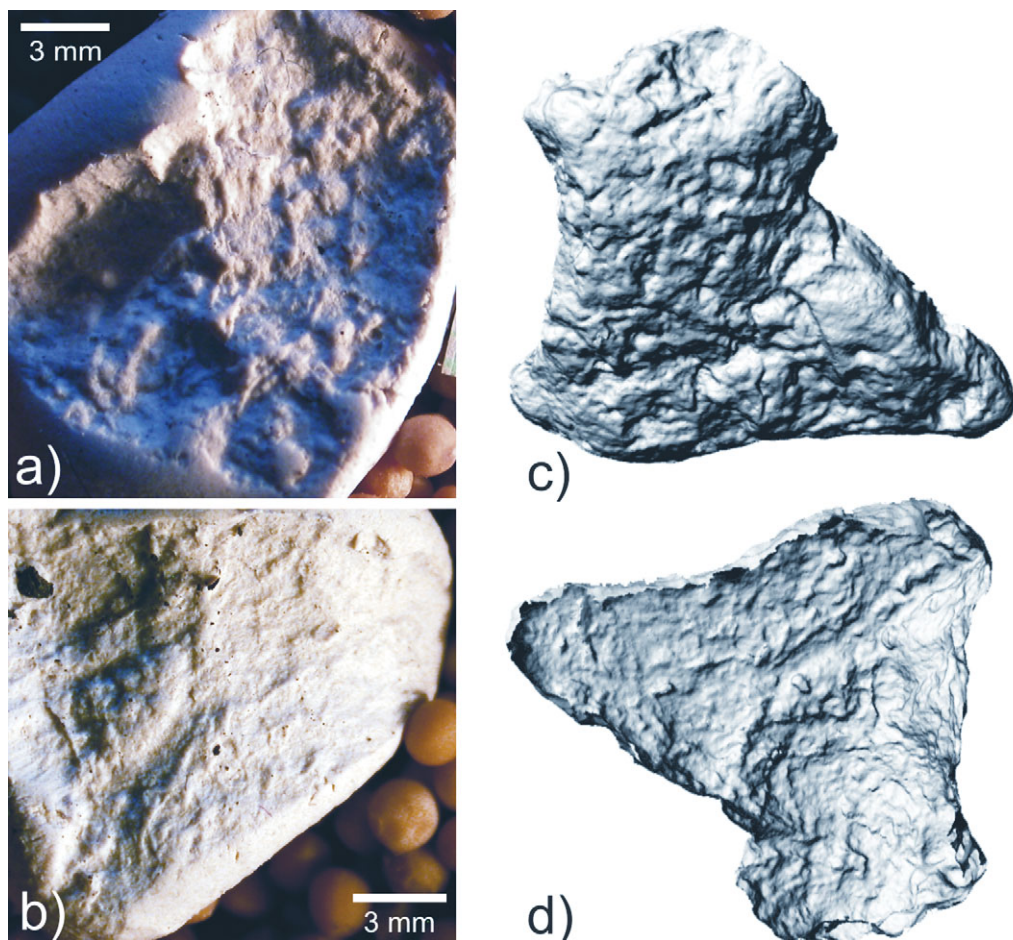


Figure 11. Pavlov VI: an imprint of crossed linear structures on one (a, c) and another (b, d) side of a ceramic object: a-b) plasticine casts; c-d) 3D surface models.

most likely depicts a lion (Figure 8). The animal's facial details are not engraved clearly, and are preserved only unilaterally. The other face was completely destroyed by a deep frontal incision produced by a sharp object while the modelled clay was still wet. This practice, possibly of ritual and/or magical significance, has been noted in several other ceramics fragments (Absolon 1945; Klíma 1979; Vandiver *et al.* 1990).

One side of a dark object bears a shallow concavity covered by shallow parallel lines (Figure 9). Their regularity, parallel character and the presence of two minutiae recognisable in a 3D virtual surface model permit us to identify the concavity as an imprint of human epidermal ridges. A second less distinct imprint is preserved on the opposite face of the same object.

In addition, we recorded regularly crossed linear structures from fibre-like materials. The distances between the fibres most frequently range between 1 and 3mm. They correspond to textile structures previously discovered and documented by Adovasio *et al.* (1996, 1999)

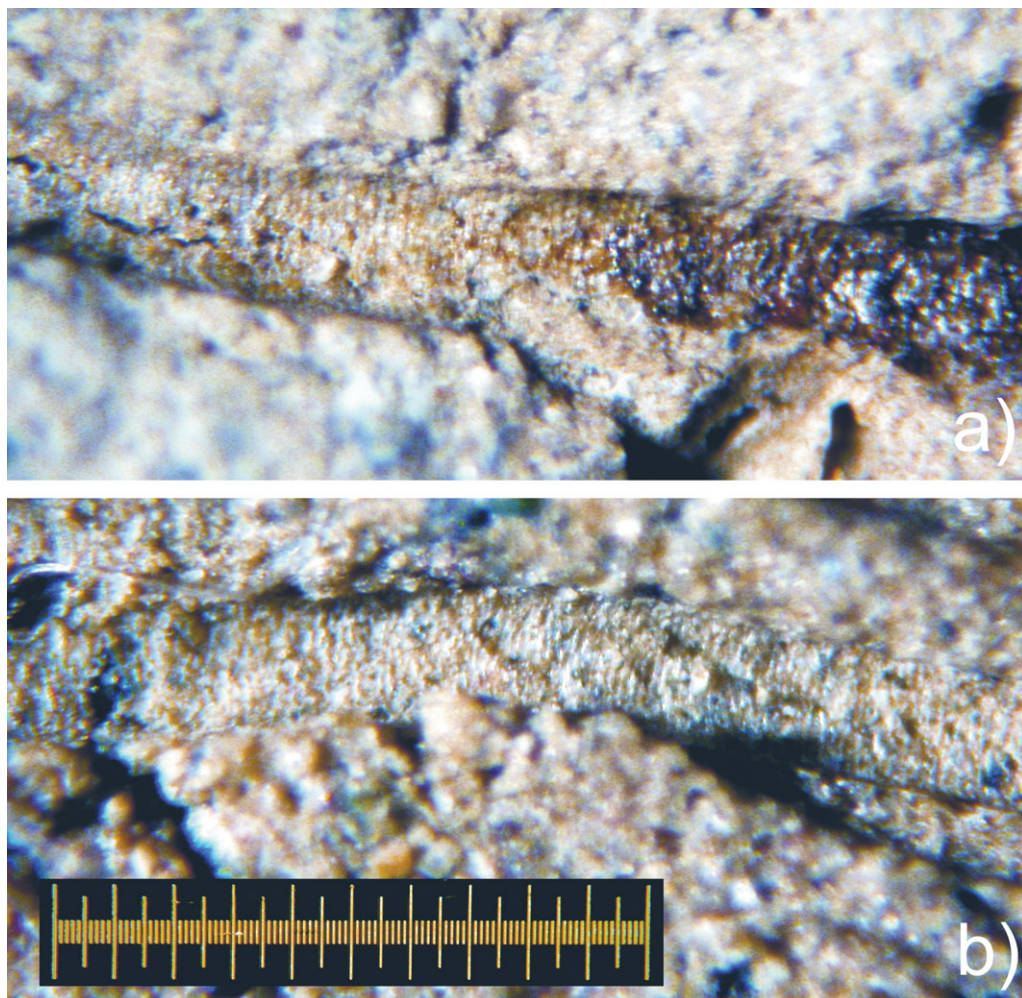


Figure 12. Pavlov VI: a) an imprint of a fibrous structure on the surface of a ceramic object; b) imprint of recent reindeer hair on ceramics. Scale = 1mm.

and Kovačič *et al.* (2005). They are present on the body fragments (Figure 10), on the bases of the three conical ‘legs’, and most clearly (and bifacially), on a small plaque-shaped fragment (Figure 11).

Additionally, we recorded imprints of animal hair on three objects, all oriented in a parallel manner. Based on cuticular microstructure and on diameter size (Figure 12), they correspond to reindeer hair (*Rangifer tarandus*).

## Conclusion

The new site, Pavlov VI, offers a clear definition of the basic living unit of the Dolní Věstonice-Pavlov Upper Palaeolithic settlement area. A satellite of Pavlov I, its location on a low elevation at a standard altitude slightly above 200m asl perfectly fits our modelled

location for Upper Palaeolithic Gravettian sites in Moravia. The singular settlement unit is approximately 5m in diameter, surrounded by sterile loess. Its structure comprises a central pit with cobbles and traces of fire, surrounded by small pits, and an accumulation of large mammoth bones. The most plausible interpretation for Pavlov VI is a separate hunting site, processing food derived from two mammoths – probably a female with a calf.

However the site also contained the remains of horse, reindeer, wolf, fox, wolverine, bear and hare, a lithic industry of the Pavlovian type, two bone artefacts, decorative objects, and modelled and unmodelled pellets of burnt clay. The majority of the ceramic pieces and fragments show some evidence of human activity or a variety of imprints. Intentional human activities, possibly of magical or ritual significance, are evidenced in the production and destruction of a carnivore head bearing a deep frontal incision. Several imprints of human fingers, animal hair and textile structures were incidentally produced as well, and these provide us with supplementary data about the richness of the perishable items that were used at the Pavlovian sites and the techniques used to make them.

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