

A Palaeolithic 'Pompeii' at Kostenki, Russia

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A new Upper Palaeolithic occupation layer has been discovered in 2000 at the site of Markina Gora (Kostenki 14) on the River Don (the Voronezh Oblast), in Russia. The layer was sealed by volcanic ash, suggesting that a natural catastrophe had put an end to a human settlement there, just as Pompeii, Herculaneum and Stabiae were destroyed and buried following the powerful eruption of Mt. Vesuvius in AD 79. The Palaeolithic site is notable for its assemblage of ornaments

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The occurrence of volcanic tephra in Upper Pleistocene deposits in the central part of the Russian Plain is a remarkable phenomenon, not least because the plain lies at a great distance from known areas of volcanic activity. Volcanic ash was first recognised in Central Russia in the 1930s and defined at Kostenki in the 1950s. For some time the ash has been considered as resulting from the eruptions of volcanoes in the Caucasus, these being the nearest to the scene. Yet the special analyses which were performed at the Institute of Volcanology at the Academy of Sciences of the USSR in the 1980s, make it possible to link the Kostenki tephra with the

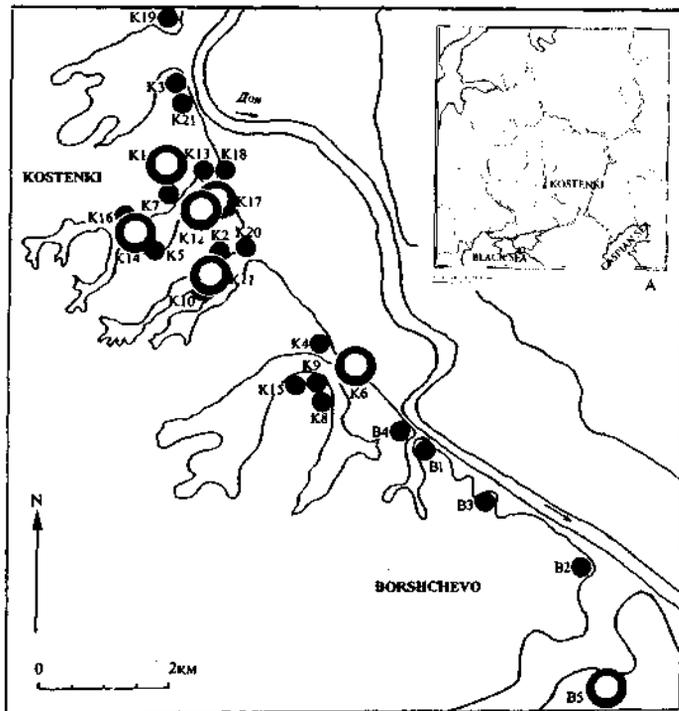


Figure 1. Kostenki-Borshchevo group of sites. A large circle marks sites with volcanic ash. A — position of Kostenki-Borshchevo area on Russian Plain.

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volcanic system at Campi Flegrei in Southern Italy where eruptions have been dated from c 38 000 BP (38 ka) (Melekestsev *et al.* 1984).

Deposits in several stratified sites in the Kostenki area (Kostenki 1, 6, 11, 12, 14, 17, and Borshchevo 5 from 2002) (Figure 1) have included layers of volcanic ash in a distinct stratigraphic position between the upper and lower humus-rich beds, thus forming a chronological marker separating the first (ancient) and second (middle) chronological groups of the Kostenkian sequence. In excavations in 2000/2001, palaeolithic cultural remains were found in conjunction with the ash at Markina Gora (Kostenki 14) on a surface less than 10 sq. m in area (Figure 2). The cultural material occurred in lenses about 1m in diameter, separated by practically pure volcanic glass (Figure 3). The thickness of the cultural layers averaged 5–10 cm, reaching 15 cm in natural hollows. The consistent size and content of the lenses suggest that these were primary contexts, with only minor displacement of archaeological materials from their initial position, and relatively rapid burial. The cultural remains included lithic and bone assemblages, fauna, small pieces of red and yellow ochre, charcoal, and pieces of burned bone. No features, such as a hearth, pits, or habitation structures, were identified.

Lithics comprise 340 items of chipped flint, 1% being tools with secondary modifications, mostly represented by their fragments. Cores were absent. Unipolar knapping was identified on the blanks with unilateral parallel dorsal surfaces. The occurrence of a series of microblades is of crucial significance for the cultural attribution of the assemblage. There were nearly 30 pieces, 19 of which revealed a micro-retouch (Figure 4). Taking into



Figure 2. Kostenki 14 (Markina gora). Work at the level of lowermost cultural layer ('horizon of hearth'). Point at the section of the east wall shows the position of volcanic ash.



Figure 3. Kmtfiki I-I (Mitrhinagom). Cultural layer in volcanic ash.

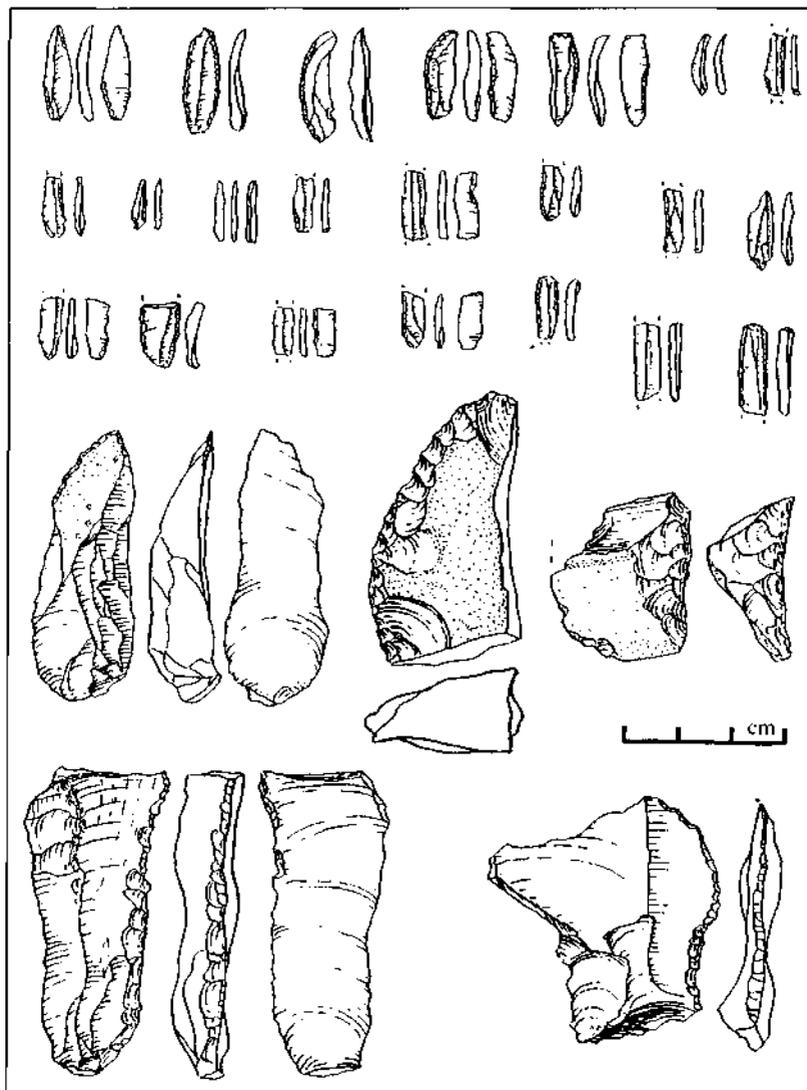


Figure 4. Kostenki 14 (Markina gora). Lithic assemblage from cultural layer in volcanic ash.

consideration particular attributes such as an asymmetric shape and twisted profile, as well as (in three cases) an alternative lateral retouch, they may be identified as *lamelles Dufour*, and, more precisely, as Roc-de-Comb variety. Although high scrapers were not found, one may reasonably suggest that they were used as a cores for manufacturing this variety of microblade (Lucas 1997; 1999; Ciotti 2000).

The faunal assemblage featured mammals, such as hare, and nearly a dozen mandibles of the Polar Fox. Significantly, the bones of small mammals were almost complete, whereas those of larger ones were usually fragmented. An abundance of bone tools is yet another feature of this archaeological assemblage, but all the tools were found in small fragments, which makes their typological identification virtually impossible.

Ornamental objects featured prominently in the artefactual assemblage. Four elongated beads made out of bone and three pendants cut from shells came from a limited part of the excavated area, which corresponded to the periphery of the site. According to Dr. I. Kuzmina (Institute of Zoology, Russian Academy of Sciences) the beads were manufactured from the diaphyses of the Polar Fox's long bone, and, in one case possibly from a bird bone. The beads are criss-crossed by deeply cut lines, mainly circular, in one case forming a spiral pattern (Figure 5). All these decorated objects had a strongly polished surface and smooth edges — suggestive of a long period of use. Elongated beads made out of the long bones of small animals are commonly found at Upper Palaeolithic sites in Europe. Similar ornaments are known from several

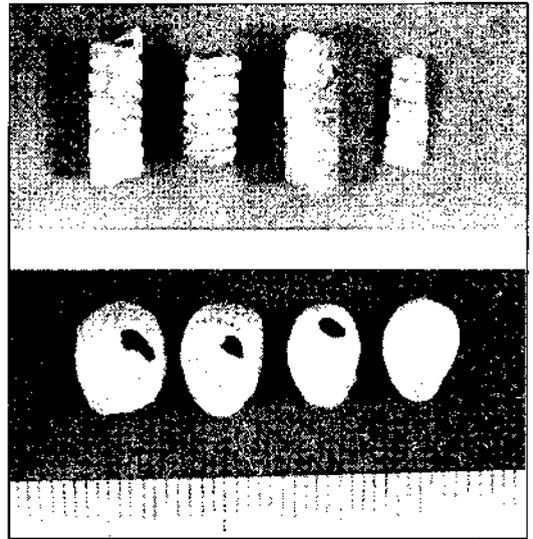


Figure 5. *Kostenki 14 (Markina gora)*. Decorated long beads from the cultural layer in volcanic ash. Shells of *Theodoxus fluviatilis Neritidae*. Three out of four with artificial punctured holes.

Aurignacian sites of Western Europe (White 1989) while their style and technology are differ from those of Gravettian sites. One of the distinctions of the Kostenki beads is in their lobes: cut in one case and incised in another.

A group of perforated pendants were made from the shells of molluscs, identified by Professor B.I.Syrenko (Institute of Zoology, Russian Academy of Sciences) as *Theodoxus fluviatilis Neritidae*, a mollusc adapted to both fresh and salt water, and fairly common in the present-day ecosystem of the River Don. Three out of four shells have small punctured holes (Figure 5). The edges of the holes were smoothed, which, as in the case of elongated beads, indicates long use. The shell pendants are widely known from Palaeolithic contexts, exploiting the common occurrence of *Neritidae*.

From the excavation of 2002 came examples of pendants made from the fangs of the Polar Fox (Figure 6). Together with the beads and the shell pendants, these would form an appropriate third component for an ornamental necklace. In contrast to similar East Gravettian (Kostenkian) things with holes made by incisions, and the same pendants of Magdalenian and Spitsynian attribution with drilled holes, the holes in the fox-teeth were punched clumsily from two sides into previously prepared planed flat surfaces, most likely by means of a punch.

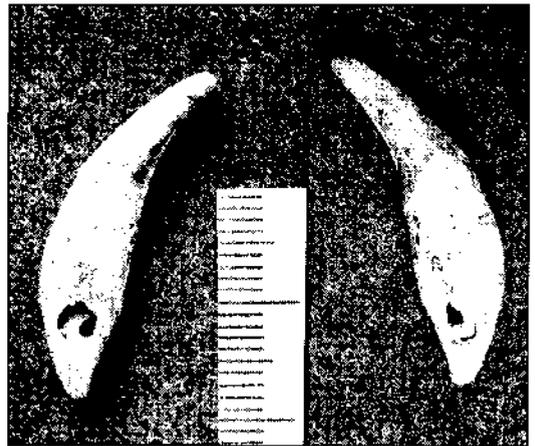


Figure 6. *Kostenki 14 (Markina gora)*. Pendant of polarfox's teeth.

Seen as a whole, and based on its main components (technology, typology, decorations), the collection of archaeological materials from the new cultural layer found at Kostenki 14 can be identified as typical Aurignacian and the closest analogy may be found in the assemblage of cultural layer III of Kostenki 1, a site with an indisputable Aurignacian affiliation (Sinitsyn 1993). Taking into account the close agreement of radiocarbon dates for the two sites: $32\ 600 \pm 400$ (GrN-17117) and $32\ 600 \pm 1100$ (OxA-7073) for cultural layer III of Kostenki 1 (Sinitsyn 1999) and $32\ 420 \pm 440/420$ (GrA-18053) for the 'ash horizon' of Kostenki 14 — they can be treated as contemporary. The decorated objects in this latter assemblage are equally the oldest to be found in Eastern Europe so far, and the personal adornments the oldest manifestation of decorative art. Until now the oldest adornments have been related to the assemblage of cultural layer II at Markina Gora dated by a consistent series of radiocarbon measurements to 28 000 BP (Sinitsyn *et al.* 1997). The basic significance of the new Kostenki 14 assemblage resides in its being the third site in Eastern Europe with typically Aurignacian affiliations (in addition to Kostenki 1, layer III, and Suren 1, layers Fb2, Ga2), although the Aurignacian layers of the latter have more recent dates (Otte *et al.* 1996; Demidenko *et al.* 1998; Pettitt 1998; Demidenko and Otte 2000-2001; Demidenko 2000, 2001). It is necessary to add that the assemblages of the two Kostenki sites appear to be not only the oldest Aurignacian manifestation in eastern Europe, but also mark the most easterly point of its dispersion.

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 layer 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. Minute volatile particles of volcanic glass can form a stable deposit on a slope falling at an angle of 6° only if a single condition is met: it would have to be covered rapidly by the sediments — otherwise, wind and water would rapidly destroy it. Even the short-lived presence of a vast volume of pyroclastic materials would screen the earth from solar radiation, giving an effect akin to a 'nuclear winter'. Further studies aim to locate the volcanic source more securely, estimate the mechanism of the fall-out and the time period involved, and the short and long-term effects on the Aurignacian populations of the Russian Plain.

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