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Kostenki: Geography and Culture

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occupation was discovered at Kostenki, adding another important dimension to these sites. The recent discovery that several sites contain occupations that underlie a 40,000-year-old volcanic ash provided evidence of the earliest known Upper Paleolithic remains in Eastern Europe. Field research continues today at Kostenki and Borshchevo, and the results continue to have an impact on world archaeology.

Introduction

Kostenki is the name of a village on the Don River in the Russian Federation where more than twenty open-air Paleolithic sites are known. Several more sites are found at the village of *Borshchevo*, which is located about 5 km downstream from Kostenki. The sites are assigned to the Upper Paleolithic and yield skeletal remains of modern humans (*Homo sapiens*). Artifacts were found in association with the remains of extinct mammals at Kostenki in 1879 and were among the first discoveries of IceAge people in Eastern Europe. By the 1930s, the sites at Kostenki and Borshchevo had produced a rich record of middle and late Upper Paleolithic occupation, including large feature complexes with traces of suspected dwelling structures. The excavation and study of the occupation floors had a significant impact on theory and method in archaeology during the Soviet period. In the years following the Second World War, substantial evidence of early Upper Paleolithic

Definition

Kostenki is located on the Middle Don River near the city of Voronezh in the Russian Federation at 51° 40′ North and 39° 10′ East. The village lies on the west bank of the river and the eastern margin of the Central Russian Upland at an elevation of approximately 125 m above mean sea level. The village of Borshchevo is situated several kilometers southeast of Kostenki. The area is within the modern forest-steppe zone and experiences a continental climate with mean July and January temperatures of 19 °C and −8 °C, respectively. Precipitation averages 520 mm per year.

A total of 21 stratified Upper Paleolithic open-air sites have been investigated at Kostenki, and five or more sites have been discovered at Borshchevo. Although several sites are found in the main valley, most are situated at the mouths or in the upper courses of large side-valley ravines that are incised into the high west bank of the Don River. Springs are active today in the ravines, and primary carbonate deposits in the

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sites indicate that they were active during Upper Paleolithic times as well (Holliday et al. 2007: 217–219). The sites are found primarily on the first (10–15 m) and second (15–20 m) terrace levels (Lazukov 1982: 21–35).

Mammoth bones were known from Kostenki centuries ago and evidently account for the name of the village (*kost'* is the Russian word for bone), but archaeological remains were first discovered in 1879 (Klein 1969: 29). Major excavations began in the 1920s and 1930s, and these were focused primarily on middle and late Upper Paleolithic occupations (especially the large Eastern Gravettian component in Layer I at Kostenki 1 (Efimenko 1958)). Early Upper Paleolithic remains were investigated in the lower layers at Kostenki 1 and other localities prior to World War II (e.g., Kostenki 6), but most research on the early occupations was initiated by A. N. Rogachev in the late 1940s (Rogachev 1957; Klein, 1969: 231–232).

The high west bank of the Don Valley, which represents the eastern margin of the Central Russian Upland, is composed of Cretaceous marl (chalk) and sand (Lazukov 1982: 15–17). Upper Paleolithic sites are buried in fill deposits of the first and second terraces of the Don River. The terraces are found in both the main valley and in portions of the large side-valley ravines incised into the west bank of the valley. The terraces are composed of alluvium, which unconformably overlies the pre-Quaternary units, capped with a complex sequence of eolian, slope, and spring deposits (Lazukov 1982: 15–22; Holliday et al. 2007: 182–184).

The uppermost alluvium is interstratified with coarse slope deposits derived from the Cretaceous bedrock (Lazukov 1982: 21). Above these deposits lies a sequence of alternating thin lenses of silt, carbonate, chalk fragments, and organic-rich loam (Holliday et al. 2007: 184–186). At many localities, they are subdivided by the volcanic tephra horizon, which has been identified as the *Campanian Ignimbrite* (CI) Y5 tephra, derived from an eruption in southern Italy and dated to ca. 40,000 cal BP (Pyle et al. 2006; Anikovich et al. 2007). Traditionally, the lenses below and above the tephra have been termed the *lower humic bed* and *upper humic bed*, respectively (Rogachev 1957; Klein 1969). The humic beds apparently represent a complex interplay of colluviation, spring deposition, and soil formation (Holliday et al. 2007). At some sites, more typical soil profiles developed, including a weakly developed soil (*Gmelin soil*) that formed during the early stages of the LGM (Last Glacial Maximum) and dates to ca. 26,000–25,000 cal BP. Above the Gmelin soil lies loess-like loam of LGM age, which is capped with the modern chernozem (Lazukov 1982; Holliday et al. 2007: 219).

Key Issues/Current Debates/Future Directions/Examples

The earliest occupation levels at Kostenki and Borshchevo underlie the CI Y5 tephra and date to 42,000–41,000 cal BP or older (Anikovich et al. 2007; Hoffecker et al. 2008). There is continuing debate and discussion about the age and cultural affiliation of these occupation levels. In the early 1950s, P. I. Boriskovskii (1963) excavated a level below the tephra at Kostenki 17 (Layer II), which yielded burins, large retouched blades, end scrapers, and microblades. Other items included bone awls and point fragments and various ornaments. A similar assemblage was recovered from below the tephra level at Kostenki 12 (Layer II). These assemblages have traditionally been labeled as a local early Upper Paleolithic industry without clear links to others in Western or Eastern Europe (*Spitsyn culture*).

A somewhat different assemblage has been found below the CI tephra in the lowest level (Layer IVb) at Kostenki 14 containing bladelets, burins, end scrapers, and several bifaces; non-stone artifacts include antler mattocks, bone points, perforated shells, and a carved ivory piece that may represent the head and neck of a (unfinished) human figurine (Hoffecker et al. 2008).

Several strikingly different assemblages have been excavated from below the tephra at Kostenki 6, Kostenki 12 (Layer III), and other sites. These occupations contain end scrapers and Middle Paleolithic flake tool types, such as

sidescrapers, small bifaces, and triangular points; non-stone tools, ornaments, and art are totally absent (Rogachev 1957; Praslov & Rogachev 1982; Anikovich et al. 2008). Traditionally, they have been assigned to an East European industry known as the *Strelets culture* (Anikovich et al. 2007: 236–240). An alternative view is that these assemblages, which are often associated with evidence for killing and butchering large mammals (primarily horse, mammoth, and reindeer), represent a functional subset of the other industry (i.e., kill-butchery tools and weapons) (Hoffecker et al. 2010).

Human skeletal remains in these layers are confined to a third molar from Kostenki 17, Layer II and the crown of a deciduous tooth from Kostenki 14, Layer IVb. Both are tentatively assigned to modern humans, which are widely assumed to have produced all of the artifacts below the CI tephra at Kostenki and Borshchevo (Gerasimova et al. 2007).

Less controversy surrounds the classification of assemblages that lie above the CI tephra, but below loess-like loams deposited during the LGM, and date to the later phases of the early Upper Paleolithic. At Kostenki 1, Layer III contains an artifact assemblage widely classified as *Aurignacian* and comprising large blades with scalar retouch, carinate scrapers, backed bladelets, and other diagnostic items (Anikovich et al. 2007: 228–233; Anikovich et al. 2008). An older Aurignacian assemblage is associated with the tephra layer at Kostenki 14 (Sinitsyn 2003).

Another group of artifact assemblages dating to this interval contains a high proportion of end scrapers, as well as typical Middle Paleolithic forms (e.g., sidescrapers, points), and a varied assortment of bone artifacts. Among the bone artifacts are diagnostic "shovels" and the oldest known eyed needles. These assemblages are found in the upper portion of the upper humic bed at Kostenki 14 (Layer II) and the lower portion of the upper humic bed at Kostenki 15 (Praslov & Rogachev 1982); both are associated with evidence for the killing and butchering of a group of horses (*Equus latipes*) (Hoffecker et al. 2010). A similar assemblage is thought to be deposited with the Streletskaya assemblage in Layer I at Kostenki 12, and the assemblage in the lower part of the upper humic bed at Kostenki 14 (Layer III) is sometimes considered part of this group (Praslov & Rogachev 1982). These assemblages are assigned to the *Gorodtsov culture* (Efimenko 1958; Rogachev 1957), which is recognized at several other East European sites (e.g., Mira in the Dnepr Valley) but unknown in Western and Central Europe (Anikovich et al. 2007: 248–265).

Skeletal remains assigned to modern humans are associated with these assemblages at Kostenki 15, which yielded the partial skeleton of a child in a burial pit, and at Kostenki 12, Layer I (Gerasimova et al. 2007: 102–105). A complete modern human skeleton also was excavated from a burial pit in Layer III at Kostenki 14 (Rogachev 1957); although mid-Holocene dates on the human bone were reported several years ago, the most recent date is more than 30,000 cal BP and consistent with the stratigraphic context of the upper humic bed. Analysis of ancient DNA from this skeleton indicates that it belongs to mtDNA haplogroup U2 (Krause et al. 2010).

At Kostenki 11 (Layer V) and Kostenki 12 (Layer Ia), the lower upper humic bed contains assemblages with diagnostic triangular bifacial points, typical Middle Paleolithic artifact forms (points and sidescrapers), and also some end scrapers and burins; non-stone artifacts are absent. Similar artifacts are found in the upper portion of the upper humic bed at Kostenki 12 (Layer I). Traditionally, these assemblages have been assigned to a younger phase of the *Strelets culture* (Anikovich et al. 2007: 236–248; Anikovich et al. 2008); they also have been interpreted as functional variants related to large mammal kill-butchery (Hoffecker et al. 2010).

Yet another industry is represented in the upper portion of the upper humic bed at Kostenki 8 (Layer II). This assemblage is dominated by backed bladelets and points and is widely considered an early form of the *Gravettian technocomplex*, other sites of which are common above the upper humic bed and its stratigraphic equivalents in Eastern Europe (Anikovich et al. 2007: 233–236; Anikovich et al. 2008).

Associated human remains at Kostenki 8 include skull fragments (Gerasimova et al. 2007: 90–91).

The archaeological remains for which Kostenki is most famous are those of the Eastern Gravettian (middle Upper Paleolithic) dating to the early phase of the LGM (~25,000 cal BP). They include, most notably, the large feature complexes at Kostenki 1, Layer I, and associated remains at the nearby localities of Kostenki 13 and 18 on the north side of the mouth of Pokrovskii Ravine (Efimenko 1958; Praslov & Rogachev 1982; Anikovich et al. 2008). The feature complexes comprise a linear arrangement of hearths surrounded by pits of varying size that contain large mammal bones and artifacts. Diagnostic artifacts include "Kostenki points," "Kostenki knives," and examples of "Venus figurines" carved in ivory and marl. The assemblages also contain burins, end scrapers, microblades, and a variety of bone and ivory implements. As in Central Europe, there is evidence for Gravettian fired ceramic technology (Praslov & Rogachev 1982). The assemblages are similar to those of comparable age (and associated with similar feature complexes) at Avdeevo and Zaraisk, and sometimes placed in a local *Kostenki culture* within the broader Eastern Gravettian entity (Anikovich et al. 2008).

Faunal remains associated with the Eastern Gravettian occupations at Kostenki are dominated by mammoth and smaller fur-bearing mammals (wolf, fox, and hare). Many of the mammoth bones and tusks are weathered, and these may have been collected from natural occurrences for use in construction of dwellings and other structures or for raw material. Most of the fuel at these sites appears to have been bone (trees were either scarce or absent during this interval), and many of the remains of large mammals hunted by their occupants may have been consumed in the hearths. At least some of the pits may have been dug to the permafrost level during warmer months and used like Inuit "ice cellars" to keep the bone fresh and flammable.

There appears to be a hiatus in settlement at Kostenki during the cold peak of the LGM (roughly 23,000–22,000 cal BP). Later Upper Paleolithic occupations include examples of oval mammoth bone houses similar to those of comparable age in the Dnepr-Desna Basin (e.g., Mezhirich) at Kostenki 2, Kostenki 11 (Layer Ia), and probably Borshchevo 1 (on the first terrace level) (Praslov & Rogachev 1982). These occupation levels date to the interval following the LGM cold maximum, before the end of the Pleistocene (19,000–14,000 cal BP), as do the more widespread mammoth-bone houses in the Dnepr-Desna Basin, although several investigators believe that they are older (e.g., Lazukov 1982).

At Kostenki 11, the mammoth-bone structure has been left in situ on the excavated floor of Layer Ia; a portion of the exposed excavation is enclosed in a museum building at the south end of the village of Kostenki. The collapsed mammoth-bone structure measures 7–8 m in diameter and is composed primarily of mandibles, scapulae, pelves, and long bones. A minimum of 36 individual mammoths are represented. Around the former dwelling, to the north, west, and south, are large pits, filled chiefly with bone debris. At Kostenki 2, a bone-lined pit burial is associated with the mammoth-bone dwelling structure (Praslov & Rogachev 1982; Anikovich et al. 2008).

Cross-References

- ▶ Europe, Early Upper Paleolithic in
- ▶ Europe, Prehistoric Art in
- ▶ European Middle-to-Upper Paleolithic Transitional Industries
- ▶ Geoarchaeology
- ▶ Holliday, Vance
- ▶ Homo Sapiens
- ▶ Human Evolution, Genetic Study of
- ▶ Human Remains in Museums
- ▶ Macphail, Richard
- ▶ Marxist Archaeology
- ▶ Paleolithic Art
- ▶ Paleolithic Bone Tools
- ▶ Russian Federation, Museums of the
- ▶ Site Formation Processes
- ▶ Social Archaeology

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