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Stone Tools from an Island in Berd Bay, Novosibirsk Reservoir

This article presents the results of a multidisciplinary study of stone tools (discoid mace-head, adze, and axe) found on an island in Berd Bay, Novosibirsk Reservoir. Trace analysis suggests that the mace-head is made of fragile sandstone, precluding its use as a striking weapon. Therefore, it was likely a ceremonial weapon. The adze and the axe are also made of a local rock—shale. The specimens resemble prestigious weapons of the Early and Middle Bronze Age from the forest-steppe zone of southwestern Siberia. Discoid mace-heads, like globular ones, are typical of the Middle Bronze Age. Importantly, all the specimens were found where the submerged Fort Berdsk was possibly situated. Early artifacts have also been found near other Siberian forts such as Tomsk, Umrevinsky, and Sayansk, suggesting that these were built at places with a long history of habitation.

Keywords: *Upper Ob, Bronze Age, stone tools, trace analysis, prestigious weapons, Fort Berdsk.*

Introduction

The area around Berd Bay in Novosibirsk Reservoir (Iskitimsky District, Novosibirsk Region) is promising for localization of the flooded objects of archaeological heritage (Borodovsky, 2002: 21–45). Before filling the reservoir, this area in the vicinity of the old town of Berdsk had almost not been surveyed. However, there was some information about random finds indicating the presence of archaeological sites at the mouth of the River Berd (Ibid.: 9). Subsequently, a number of stone items were found on the shallows of Khrenovy Island during regular discharges of water from the reservoir (Fig. 1, 2), including a disc-shaped finial submitted to the Berdsk Historical and Art Museum (VKEFZK* 15/3), and two tools (Fig. 2, 2, 3) discovered by N.V. Ermakova, which are kept in the collection

of the Novosibirsk State Museum of Local History (GK 9089827 NGKM, OF-22851/1 and 2). According to their morphological features, the artifacts belong to the turn of the fourth to third millennium BC, and mark one of the early periods in the development of the area where Fort Berdsk was founded in the early 18th century (see Fig. 1, 1). Microscopic study of these items involved the methods of experimental trace analysis and technological analysis, elaborated by S.A. Semenov and G.F. Korobkova (Semenov, 1957; Korobkova, 1999). The experience of working with evidence from the archaeological collections of Paleolithic and Neolithic sites in Northern and Central Asia was also applied (Volkov, 1999, 2010, 2013). For general trace examination of artifacts, the MBS-10 binocular microscope, with one-sided lateral illumination of the item and discrete operating mode of magnification from 16 to 56 times, was used. For comparative analysis of wear traces on ancient stone tools, the evidence from the Siberian reference collection of trace standards was

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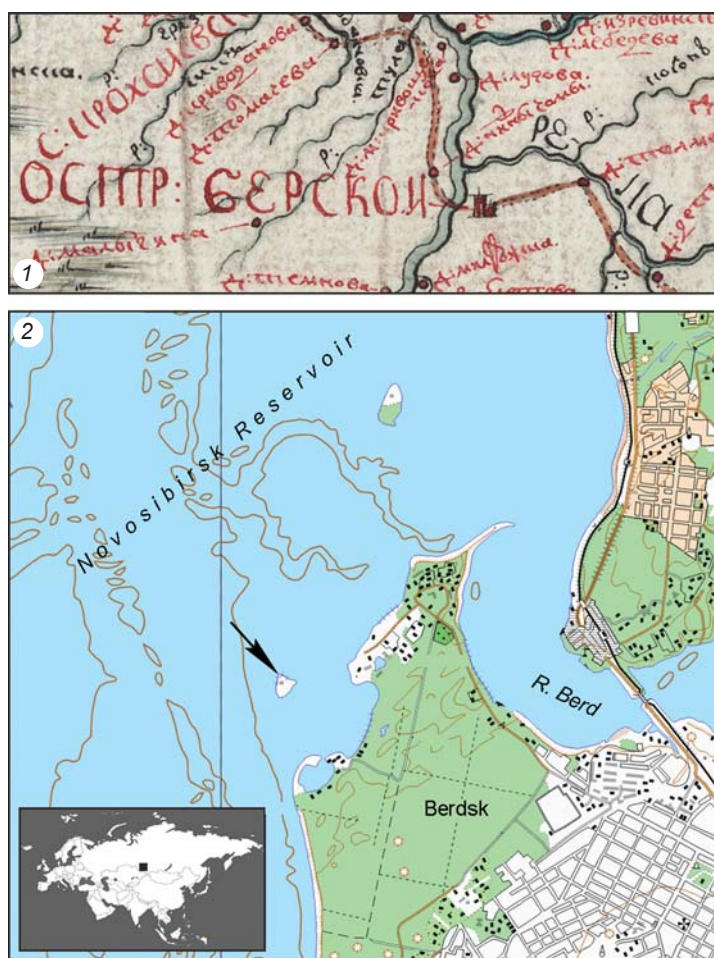


Fig. 1. Fort Berdsk on the General Map of the Office of the Kolyvan-Voskresensk mining authorities (Generalnaya karta..., 1777) (1) and the place of discovering lithic artifacts in the area of its possible location (after (Borodovsky, 2002: 4)) (2).

employed. The terminology of trace analysis used in this article corresponds to the catalog of terms in the monograph “Experimental Practices in Archaeology” (Volkov, 2013: 99–126).

Research results into the items and discussion

The disc-shaped finial is 92 mm in diameter and 27 mm in thickness. It weighs 278 g (see Fig. 2, 1) and was made from a flattened, rounded river pebble of relatively loose sandstone. The lateral surface and one of the relatively flat sides of the item were grainy and rough, and show no traces of processing (Fig. 3, 1). Naturally spalled surfaces, polished on a relatively fine-grained abradar in some places, are observed in several areas of the pebble (Fig. 3, 2).

The pebble blank had been processed with an abradar in order to flatten the item. Probably, the polished surface was wet, which led to the noticeable destruction of the

sandstone and the emergence of relatively deep linear traces under the impact of its particles (Fig. 3, 3). As the treated surface dried, the marks became less deep (Fig. 3, 4) and, accordingly, the quality of processing increased.

The hole in the item was made by drilling from the unpolished side. The technological traces indicate the use of high-speed drilling with uniform translational movement of the tool (Fig. 4, 1). The edges of the channel at the point where the tool entered the processed material are even. No traces of punching or displacement of the point of the drilling start have been found (Fig. 4, 2). There are reasons to believe that the process was suspended at the moment when the first marks of the exiting drill appeared on the opposite side, and the exit section of the drilling channel was flared using a reamer: its operation is manifested by stepped traces of a stop in the rotational movement of the tool clockwise (Fig. 4, 3).

No signs of increased or repeated fitting of the item on any base were found on the surface inside the hole. Microscopic examination of the artifact's surface revealed no traces of use.

Massive stone discs might have served several purposes. One of them was weighting elements for digging sticks or drilling devices (Aseev, 2003: 144, fig. 96). With this use, almost any item made of loose, fragile stone (which was used for making the disc from the island in Berd Bay) would inevitably show marks of forced or repeated fitting on the handle. Such marks were not found on the stone disc under discussion. No marks from a wedge, which was often used while fastening flywheel weights on spindles, drilling devices, tools for making fire,

etc., were present on the edges of the hole.

It is also unlikely that the disc from the island in Berd Bay was used as a fishing sinker. Stone sinkers for nets were not made of such loose material that becomes weak when wet. Even if this artifact was used for that purpose, it would have been a one-time use. Therefore, it was hardly worth the effort and application of very “serious” tools for drilling it. Notably, the item in question was generally not suitable as the central sinker of a drag-net, because it has small size and weight.

Judging by its morphological features, the disc-shaped object from the island in Berd Bay can be described as the finial (head) of a mace or club*. The mace is a short-

*According to some secondary sources, a mace was a variety of club (Bolshaya Rossiyskaya entsiklopediya, 2004: 220), while according to other sources, these were different types of impact-crushing weaponry (GOST R 51215-98, 1999: 4, 5; Kulinsky, 2007: 18, 23).

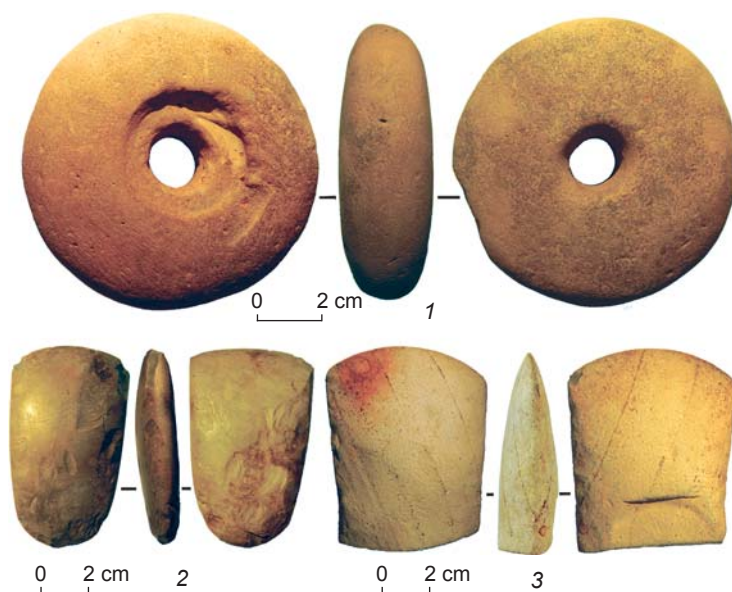


Fig. 2. Disc with a hole (1), adze (2), and axe (3).

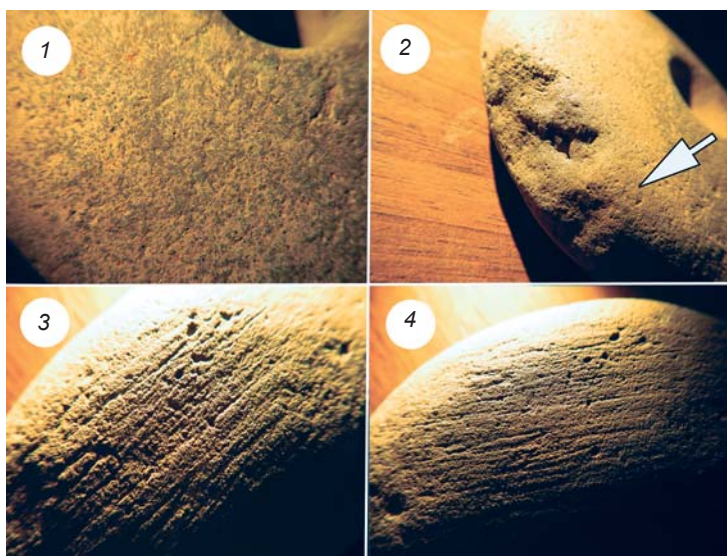


Fig. 3. Natural surface of pebble blank (1), polished natural spalled surfaces (2), and areas with traces of polishing with coarse and fine-grained abrader (3, 4) on the disc-shaped item.



Fig. 4. Surface inside the hole of the disc-shaped item (1), on the entry (2) and exit (3) sections of the drilling channel.

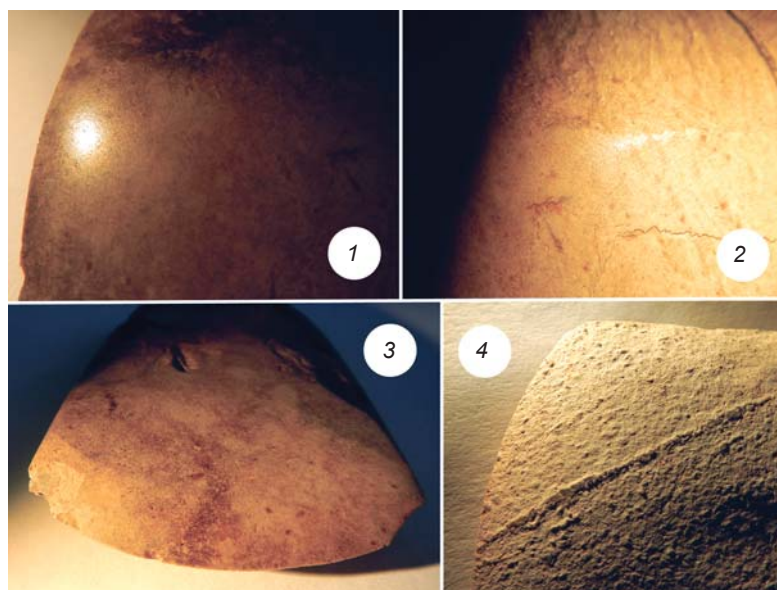


Fig. 5. Traces of adze wear on the convex (1, 2) and concave (3) parts of the working edge and surface of the working edge of the axe (4).

handled impact-crushing weapon. Its handle is about 0.5–0.8 m; the weight of the head is 200–300 g.

Marble and slate finials with serrated edge for stunning fish have been found on the clubs from the Southern Primorye and Amur Region in the Neolithic and Early Metal Ages (Kononenko, Alkin, 1994). If we assume that this artifact was used without immersing it into the water while stunning fish, we should note that the phenomenon of massive spawning of fish, as it happens in the Amur River where such practice was possible, is untypical of the Upper Ob River.

In the context of the functional and symbolic interpretation of the stone disc with a hole, it is important that maces (clubs) served as insignia of power in China and Korea. These insignia were one of the cultural universals in manifesting social hierarchy. Stone mace finials of the Middle and Late Bronze Ages have been found at several sites (Shlyapovo, Kirza, Milovanovo-3, Fedosovo) in the Novosibirsk Ob region (Borodovsky, 2002: 8, 69). However, they all were of the spherical type, while the item from the island in Berd Bay was disc-shaped. Nevertheless, its weight corresponds to functional parameters of this high status weapon.

Trace analysis of marks on the surface of the artifact from the finds of N.V. Ermakova, with the collection number GK 9089827 NGKM OF-22851/1, has made it possible to identify it as an adze—the tool for processing wood (see Fig. 2, 2). The size of the item is $9.2 \times 5.7 \times 2.1$ cm; its weight is 54 g. Traces of wear in the form of distinctive polishing (Volkov, 2013: 122–123) are observed along the entire working edge of the tool on its convex surface (Fig. 5, 1). The degree of wear of the adze was

relatively high. Individual traces of active contact with the processed material (Fig. 5, 2) were found at a significant (over 1 cm) distance from the cutting edge. The spread of polishing on the concave part of the working edge is minimal, and is typical for the tools of this type (Fig. 5, 3).

The artifact with the collection number 9089851 NGKM OF-22851/2 was identified by its morphological features as an axe (see Fig. 2, 3). Its size is $10 \times 7 \times 2.8$ cm; its weight is 76 g. Considering that one end of the item was broken, the initial size of the axe had been much larger. The tool was made of fine-grained sandstone; it was subjected to intense destruction in the aquatic environment, and no traces of use have been preserved on its surface (see Fig. 5, 4).

The morphology of the stone axe and adze is relatively standard for the sites of the Late Bronze to Early Iron Ages in the Upper Ob region. However, the presence of this set of items in the hypothetical area of the flooded Fort Berdsk is indicative for reconstructing the historical dynamics in the development of that place.

Conclusions

A set of stone artifacts (mace finial, axe, and adze) that was discovered on the island in Berd Bay has close parallels in the grave goods from some Chalcolithic burials (Fig. 6, 1, 2) at the Borovyanka XVII flat-grave burial ground, in the Middle Irtysh region (Khvostov, 2001). The head of the stone mace from the area of the former mouth of the River Berd also shows obvious parallels with one mace of the Bronze Age from Southeast England, currently

Fig. 6. Burial 112 at the Borovyanka XVII burial ground (according to the archival evidence of A.S. Trufanov).

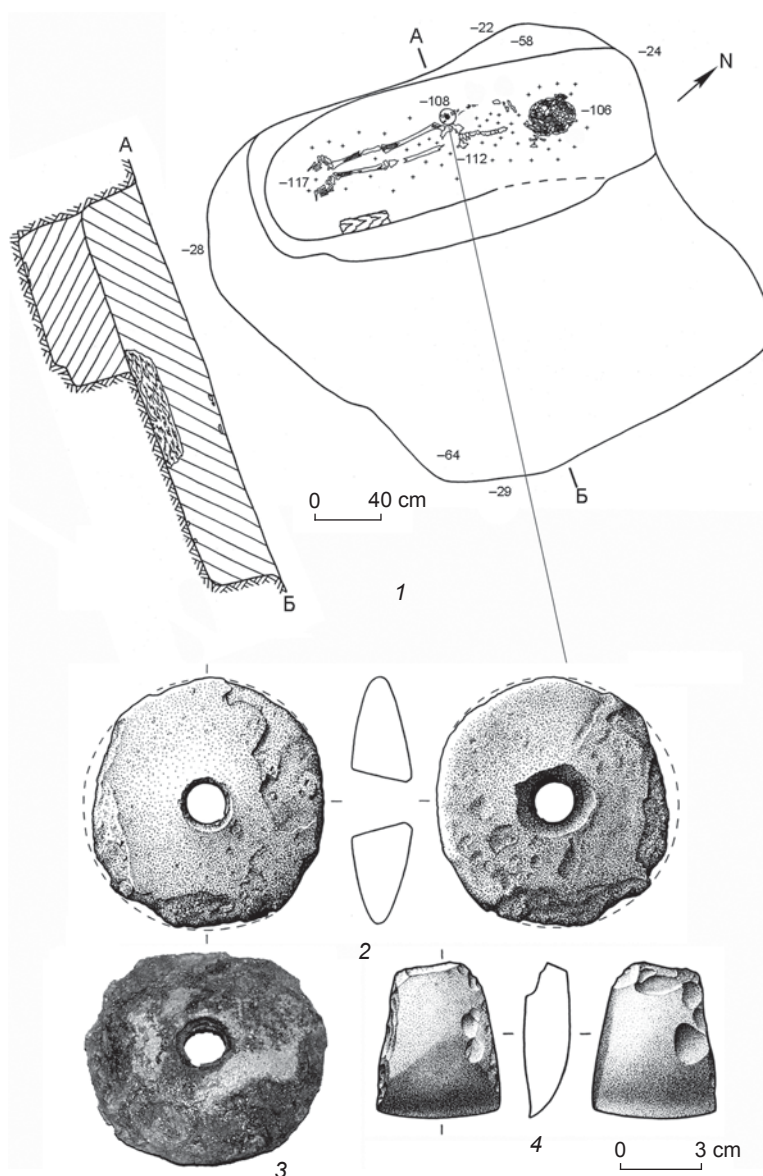
1 – ground plan and cross-section of the burial; 2–4 – stone inventory: 2, 3 – mace finial, 4 – adze.

on display at the Higgins Art Gallery and Museum in Bedford (item No. 13/9/2k).

The typological and functional features of stone items from the island in Berd Bay indicate the period of the finds as the turn of the Early and Middle Bronze Age. The disc-shaped mace finial was most indicative for such dating, since disc-shaped and spherical varieties of mace-heads were typical of the Middle Bronze Age. This morphological feature makes it possible to consider the complex of the finds under discussion as the earliest artifacts in the area around the mouth of the River Berd. Broad territorial parallels for the finial of a stone mace emphasize the chronological specificity of this item.

The use of a natural form of stone (a pebble) for manufacturing the disc-shaped finial corresponds to the archaic technological tradition of adopting natural forms. This can be most clearly seen in the bone-carving (Borodovsky, 2012) and woodworking industries of the Stone and Metal Ages. In addition, there are precedents for ritual adoption of unusual or “correct” shapes of stones in the ethnographic practices of the peoples of Siberia. All this points to the possible sacred semantics of the material used for the mace-head. This is a fairly important feature for a mace as a high status weapon. In this context, the functionality of the material was unimportant. Sandstone is not only not resistant to mechanical stress, but also prone to loosening even with slight moisture. This circumstance may explain the absence of traces of intense use on the mace finial from the island in Berd Bay.

Thus, these material and functional features once again emphasize the votive nature of the stone mace finial and its possible connection with high-status objects. The very fact of discovering a set of stone items (finial of a mace, axe, and adze) at the location of Fort Berdsk reveals the area at the confluence of the Berd and Ob rivers as a territory with a fairly long history of development. This situation was typical for the most strategically important parts of the historical landscape. In the Early Modern period, precisely such locations were used for building some Russian forts (Fort Sayansk, Fort Tomsk, Fort



Umrevinsky) in Siberia (Vasiliev, Skobelev, 1998, 2001; Skobelev, Mandryka, 1999; Nechiporenko, Pankin, Skobelev, 2000; Chernaya, 2002: 15; Borodovsky, Gorokhov, 2009: 25). The discovery of rather early and unusual artifacts in the hypothetical place of Fort Berdsk (1717) is one indirect sign of its localization.

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