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"Caster's Cache" from Tartas-1, Late Krotovo (Cherno-Ozerye) Culture, Baraba Forest-Steppe*

A "caster's cache" discovered at Tartas-1 cemetery in the Baraba forest-steppe is described, and compared with other similar finds. Caches are very rare in Siberia. Because descriptions are incomplete, their total number is unknown. The Tartas-1 "cache" was found in a rectangular pit close to Late Krotovo (Cherno-Ozerye) burials. The infill of the pit contained a mandible; part of a scapula and an incisor from a horse; a rib-fragment and fragments of the cranium of a cow; and potsherds from at least three vessels. The "cache" consisted of fifteen items: a whetstone, a bone arrowhead, two copper ingots, a fragment of a bracelet with a spiral end, a bronze needle, six fluted cylindrical beads, and three bronze knife-like pendants. Parallels to each artifact are discussed. Especially noteworthy are standard copper ingots that were used for storing and transporting metal during trade operations. Evidently, metal items in this "cache" were laid in for future use in manufacture or trade. The "cache" might have been ritual as well. All its items are typical of Late Krotovo (Cherno-Ozerye) culture of early or mid-2nd millennium BC.

Keywords: *Western Siberia, Baraba forest-steppe, Bronze Age, Late Krotovo culture, cemetery, cache.*

Introduction

The casters' caches represent one of the most interesting and, in essence, understudied type of archaeological records. Such objects were first singled out to form a separate category by E. Chantre as early as in the second half of the 19th century (Chantre, 1875–1876: 68). In the classifications developed later by J. Dechlette and V.G. Childe, they were presented as a special type of cache (Childe, 1930: 43–45). The issues of interpretation of casters' caches were to a greater or lesser extent addressed by O.A. Krivtsova-Grakova, V.S. Bochkarev, S. Hansen, and other researchers (Krivtsova-Grakova, 1955: 132–150; Semenov, 1977: 27–28; Bochkarev, 2002: 46–47; Hansen, 1994: 370–371).

Archaeological sites of this type are underexplored, despite the attention that was attracted to them rather early. Caches are very rare in Siberia, and, because descriptions are incomplete, their total number is unknown; so the "cache" of bronze items discovered during archaeological studies in the area of Tartas-1 cemetery is of great interest.

Archaeological context of the "cache"

The "cache" was found in pit No. 109 (Molodin, 2006), which had the shape of a rectangle elongated along the

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NW–SE line, with strongly rounded corners (Fig. 1, *1*). The upper edge of the eastern wall was severely damaged by the ditch of a road that passed through the territory of the site in the 18th–20th centuries. The pit has inclined walls, and a cup-shaped bottom that deepens smoothly towards the center. The dimensions of the pit are 2.8 × 1.7 m along the upper outline, and 2.30 × 1.18 m along the lower outline. The depth is 0.83–0.96 m.

Sediments in the pit have complex stratigraphy, which suggests that their accumulation was gradual (Fig. 1, *2*). The following items have been found in the central part of the pit: a mandible; a fragment of a scapula and an incisor from a horse; a rib-fragment and parts of cranium of a cow. Also, potsherds from at least three vessels have been identified (Fig. 2), one of which was found in pieces and can be perfectly reconstructed (Fig. 2, *2*).

15 items concentrated in two compact piles have been discovered in the north-western corner of the pit, in a gray sandy loam layer at a depth of 0.71 m from the subsoil surface. Obviously, at first, they were placed in some non-extant container. The first accumulation included six artifacts: a whetstone, a bone arrowhead, two copper ingots, a fragment of a bracelet with a spiral end, and a bronze needle (see Fig. 1, *4*). The second accumulation, located slightly to one side, contained six fluted cylindrical beads and three knife-like pendants, all made of bronze.

It can be assumed that pit No. 109 was planigraphically related to several Late Krotovo (Cherno-Ozerye) burials; it was constructed for ritual purposes. Burials No. 74 and No. 85 are closest to it, other graves are at a distance of 10–15 m. Both burials were destroyed as early as ancient times; however, they are typical of their cultural formation.

The burial rite of Krotovo and subsequent Late Krotovo (Cherno-Ozerye) cultures gave pride of place to the graves accompanying the pit. Often, the main part of the grave goods, mortuary and sacrificial food were placed in them. This was noted at all large Krotovo and Late Krotovo (Cherno-Ozerye) cemeteries.

The reconstructed vessel (see Fig. 2, *1*, *2*) allows determination of the cultural attribution of the assemblage under consideration. It is a small pot-shaped flat-bottomed container with a distinct ridge along the body. The vessel is ornamented with a composition in the form of sub-triangular festoons along the rim and the bottom part, and with rhomboids made by rough depressions of a comb-stamp along the body. The vessel is associated with Andronovo artifacts. At the same time, the rough style of execution does not allow attribution even to the Andronovo settlement ware, to say nothing of the ritual ware. Undoubtedly, this vessel is related to the pottery of the Late Krotovo (Cherno-Ozerye) culture, the burials of which are well known in the Irtysh basin (Molodin, 2014). Some vessels discovered at the Chernoozerye I burial ground in the Middle Irtysh basin can be attributed to the closest parallels of the vessel under consideration (Gening, Stefanova, 1994: Fig. 13, *1*; 18, *1*; 25, *2*). Also, a fragment of the bottom portion of another vessel ornamented by a "smooth rocking stamp" has some resemblance to the analyzed vessel (Ibid.: Fig. 4, *2*).

Thus, this assemblage can be identified with certainty as Late Krotovo (Cherno-Ozerye). This conclusion is also supported by the metal objects included therein.

Description and analysis of the "cache" items

Of great interest are the copper ingots forming part of the "cache". *Ingot No. 1* has the shape of a disk-like cake (Fig. 3, *1*). Its dimensions are 4.8 × 4.4 cm, the thickness is 0.5 cm near the ingot edge and 0.9 cm at the center; the weight is 88 g. On the convex surface of the item, blowholes and an impression of coarse paste can be traced (Fig. 3, *1*, *a*). The other surface, slightly concave as a result of volumetric shrinkage, shows crystallization traces of hot-metal surface-tension. A tree-like structure typical of solidification of metal in an open mold is easy to see (Fig. 3, *1*, *b*). Apparently, the ingot was made in an open working chamber in the form of a dome-shaped depression. A metal-flow solidified at the end, which is preserved in a gaseous cavity, points to the fact that the item was cast rather than formed in a crucible (Fig. 3, *1*, *a*).

Such items are well known to researchers, and considered to be standard ingots that were used for storing and transporting metal during trade operations. They are most frequently referred to as plano-convex ingots (or bun-shaped ingots) in the literature (Tylecote, 1987: 37, fig. 19; Avilova, Terekhova, 2006: 153; Avilova, 2008: Fig. 41, *1–18*).

Ingots of this type, encountered over a considerable range of territory of Eurasia, represent a wide chronological range. The earliest samples originate from the Near East, and are dated to the beginning of the 3rd millennium BC (Pigott, 1999). In Anatolia, they have been found in assemblages dated to the middle of the 3rd millennium BC (Mahmutlar) (Avilova, Terekhova, 2006: 18–19, fig. 3, *1–18*; Avilova, 2008: Fig. 41, *1–18*). Similar finds from Iran pertain to the same period (Tallon, 1987).

By the end of the Bronze Age, plano-convex ingots were spread around the entirety of Western Asia and Asia Minor (Tylecote, 1987: 194–209). Such objects are also known in the territory of Kyrgyzstan (Kozhomberdiev, Kuzmina, 1980: 141, 150, fig. 1, *14*). In Western Europe, they are encountered in Slovakia, Hungary, and Central France (Mozsolics, 1985: Taf. 1, *1–3*; 4, *2*; 17, *1a*, *b*; Cordier, 2009: 331, fig. 250).

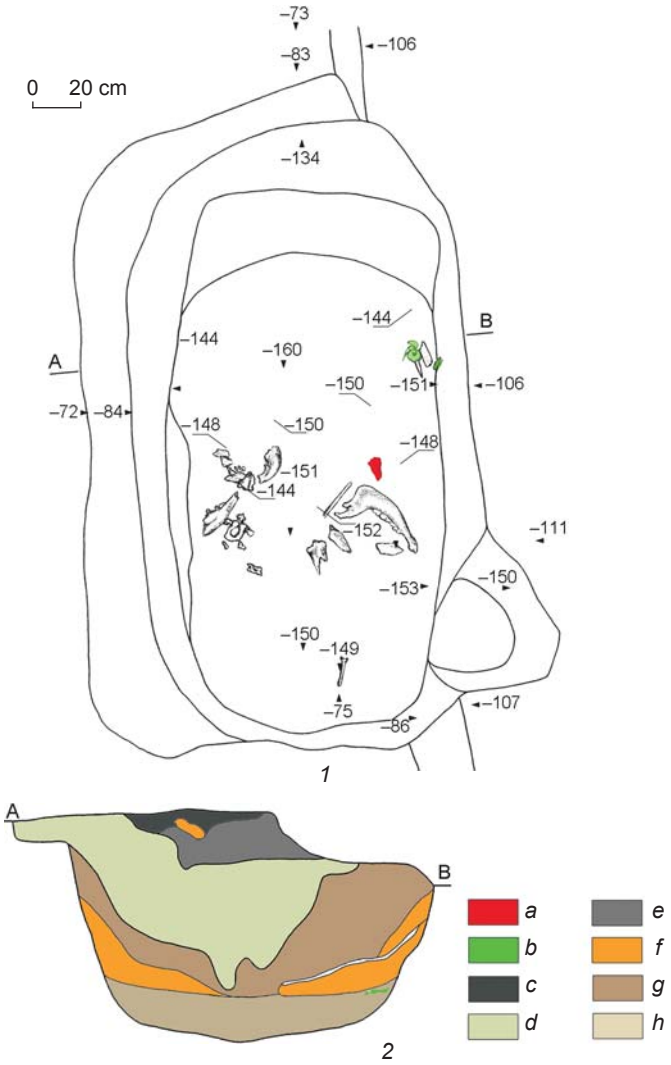

Fig. 1. Location of the "caster's cache" in pit No. 109.
1, *3* – layout of the pit; *2* – profile of the pit: *a* – pottery; *b* – bronze items; *c* – heterogeneous mixed dark-gray sandy loam; *d* – homogeneous loose black sandy loam; *e* – black sandy loam; *f* – dark-gray sandy loam; *g* – packed gray-yellow loam; *h* – light-gray sandy loam; *4* – "caster's cache" (accumulation No. 1).

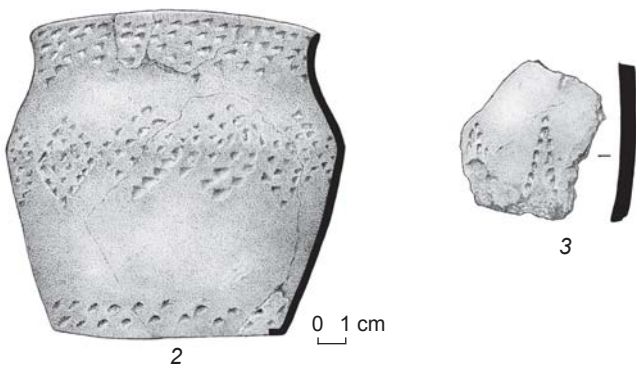

Fig. 2. Pieces (*1*) and reconstruction (*2*) of vessel No. 1, fragment of vessel No. 2 (*3*).

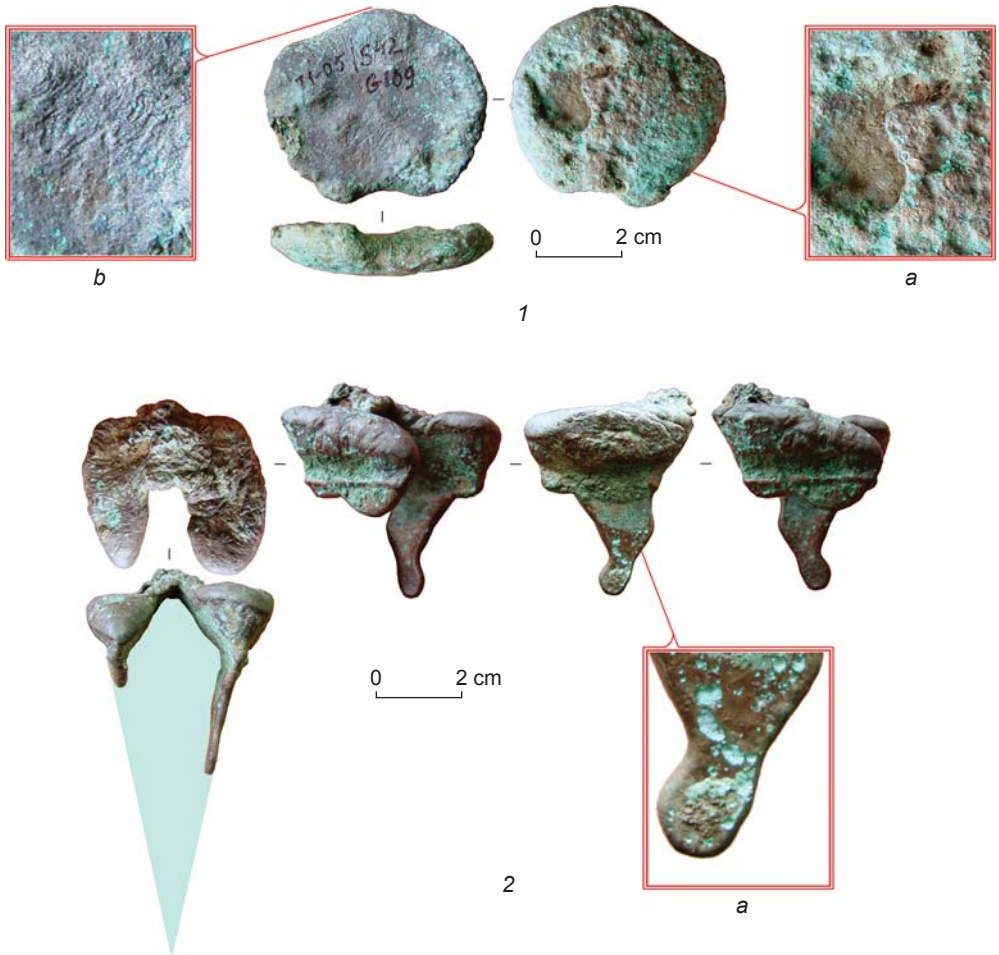

Fig. 3. Copper ingots from the "cache".
1 – plano-convex copper ingot No. 1: *a* – blowhole and solidified end metal flow, *b* – tree-like structure of the ingot surface;
2 – ingot No. 2 (sprue): *a* – crystallization traces at the metal flow end.

Ingots of this type are often considered as products of initial melting performed at the metal mining location. For example, they have been found in the Kargaly copper mining-metallurgical district in the southern Urals (Chernykh, 2007: 108, fig. 7, *8*). Seven large plano-convex ingots discovered in the Orenburg Region, two of which are presumably attributed to the Andronovo (Alakul) culture, are associated with the same district (Pazukhin, 1969: 239, 244, fig. 1–7).

Plano-convex ingots from Siberia are mainly represented by occasional finds belonging to poorly documented museum collections composed as early as the end of 19th–beginning of the 20th century. For example, several such items are stored in the Minusinsk museum (Sunchugashev, 1975: 123–124, fig. 49). All of them belong to the materials collected in the areas of ancient mine-openings and are not dated.

Finding a plano-convex ingot in a closed, well-dated assemblage suggests that standard ingots of this type in the Central Baraba became widespread rather early: not later than the early–mid-2nd millennium BC. Moreover, the presence of molds for casting small ingots of the same type at a variety of settlements of the preceding Krotovo culture does not allow unambiguous interpretation of the Tartas find as an imported one (Molodin et al., 2012: 116–118, fig. 13, *14*). Obviously, involvement of the Baraba population in the exchange of remote goods, related to delivery of nonferrous metal which formed the basis of the Bronze Age economy, facilitated distribution of standard ingots with the most popular shape.

It should be noted that ingots of another type (in the form of rods with circular or semicircular cross-sections), which were widespread in the east, were also known in the Krotovo culture (see: (Avilova, 2008)). Molds for manufacturing such items have been discovered at the Krotovo settlements (Molodin, 1977: Pl. LXI, *1*, *2*) and in the Late Krotovo (Cherno-Ozerye) funerary complex of the Sopka-2/5 burial ground (Molodin, 1985: Fig. 28, *5*).

Ingot No. 2 is a sprue consisting of two metal-filled casting-pots with a splitter and two pouring-gates (Fig. 3, *2*). The weight of the ingot is 56 g. The casting-

pots have the form of oval hoppers. Crystallization traces of hot-metal tension film are easy to see on their surfaces.

The first casting-pot of 3.0 × 1.2 cm in size (along the upper edge) and 1 cm in height passes into a slot-like pouring-gate 1.5 cm wide and 0.15 thick; a relief fillet of the working-chamber wall can be traced on the outer surface of the channel. The second pot of 3.1 × 1.4 cm in size and 1 cm in height passes into a slot-like channel of the pouring-gate 2.1 cm wide and 0.15 thick.

In the course of casting, metal solidified in motion, as indicated by crystallization-traces at the ends of flows that came to a stop in both channels of the pouring-gates (Fig. 3, *2*, *a*). This defect was obviously caused by insufficient heating of the metal to be cast. Taking into account the convergence-angle of casting's walls, it can be assumed that the craftsman tried to make a wedge-shaped tool of 9.2 cm in height with a bushing of 3.2 cm in width and at least 4 cm in length (Fig. 3, *2*). Judging by the parameters, it was intended to produce a celt. The tool should have been ornamented with a relief fillet, remains of which can be traced on the defective casting, along the upper edge of the bushing.

Fluted beads are represented in the assemblage by 6 specimens (Fig. 4, *b*). Finds of this type are encountered throughout the entire territory of the Andronovo culture's distribution, and are most frequently dated by the period of its existence (Demin, Zaprudsky, Sitnikov, 2011: 42, 54, fig. 11, *6*, *11*, *15*, *19*; 16, *14*, *15*).

A needle has a circular cross-section and an eye at the end, slightly flattened by forging (Fig. 4, *5*). It bears traces of long-term usage; the surface is polished, the point and upper part of the eye are broken. The needle's diameter is 1 cm, the length of the remaining portion is 3.3 cm. Such items existed in an immense territory for a prolonged period. In the Central Baraba, they were found both in Krotovo burials of the Sopka-2/4B, C cemetery, and the Andronovo (Fedorovka) sites Abramovo-4 and Pogorelka-1 (Molodin, 1985: 64, 104; Nagler et al., 2012: 51, fig. 1, *6*).

A fragment of a bracelet is the end of a tapered spiral, intentionally broken off from the main portion (Fig. 4, *4*). Such bracelets have been discovered in Late Krotovo (Cherno-Ozerye) burials of the Sopka-2/5 cemetery (Molodin, 2014) and the Tartas-1 site (Molodin et al., 2006: 423–424, fig. 1). It should be understood that availability such ornaments in Late Krotovo assemblages is due to the influence of Andronovo populations: ornaments of this type are peculiar to their ethnographic costume (Molodin, 2014). According to some researchers, such bracelets should be attributed to the Andronovo (Fedorovka) culture, though they were also found in the Alakul and Petrovka sites (Avanesova, 1991: 69; Vinogradov, 2011: Fig. 52, *17–19*; Demin, Zaprudsky, Sitnikov, 2011: 55). They are also known in the Late Krotovo (Cherno-Ozerye) sites of the Irtysh basin (Gening, Stefanova, 1994: 8, *5*).

Adornments of this type were most commonly encountered in the territories to the west and southwest of the site under study. They have been found at a number of Andronovo sites of Northern Kazakhstan (Sorokin, 1960: Pl. XL, *1–4*; XLII, *14*, Ermolayeva, 2001: 105, fig. 3), Altai (Demin, Zaprudsky, Sitnikov, 2011: 44–45, 55–56, fig. 7, *1–3*; Zimina, Adamenko, 1963: 58, fig. 3, *3*), the Middle Irtysh basin and Southern Trans-Urals (Krivtsova-Grakova, 1948: 109, 111, fig. 37, *1*, *2*, *4*).

Bracelets with tapered spiral ends are most frequently dated to the early–mid-2nd millennium BC (Kovtun, 2014: 30). Radiocarbon dates for the Andronovo sites located in the south of Western Siberia, which contain such adornments, also fit in the range from the 18th to the 14th century BC (Kiryushin et al., 2007: 256–258).

Knife-like pendants are represented by 3 specimens. They differ in their sizes, shape, and ornamentation. The first (the largest) pendant has a laurel-leaf shape (Fig. 4, *1*). Its length is 7.1 cm, the maximum width is 1.6 cm. The upper portion has two through holes: a round hole 0.2 cm in diameter and an oval one 0.3 × 0.1 cm in size. The holes are punctured from the back by a thin tool with a circular cross-section. A thin rim formed

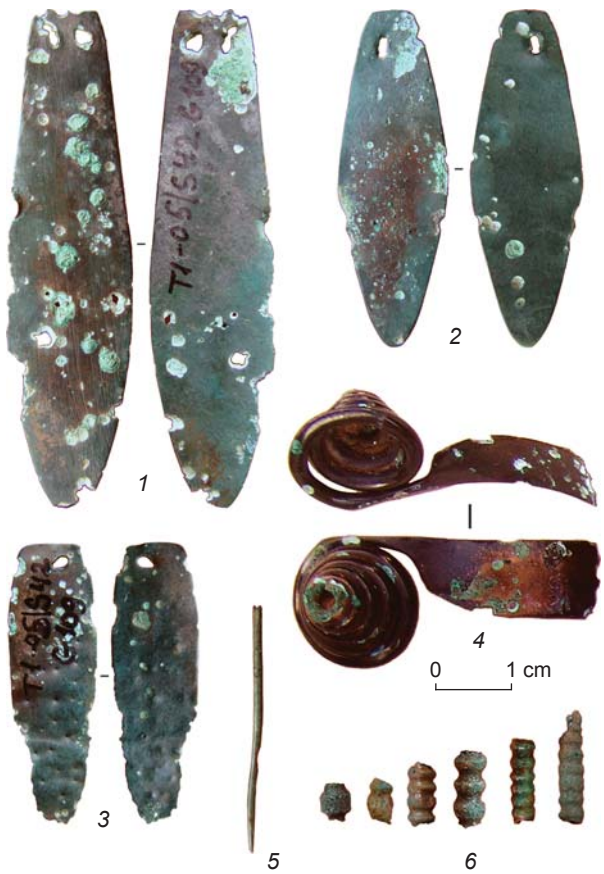

Fig. 4. Bronze artifacts from the "caster's cache".
1–3 – knife-like pendants; *4* – a fragment of a bracelet with a cone-shaped end; *5* – a needle; *6* – beads.

Fig. 5. A bone arrowhead (*1*) and a whetstone (*2*).

around the hole was cleaned out with abrader. Traces of rough grinding in the form of long and deep longitudinal scratches are discernible on the front surface.

The second pendant is diamond-shaped (Fig. 4, *2*). Its length is 4.6 cm, the maximum width is 1.5 cm. There are two holes near the upper edge: a round hole 0.1 cm in diameter and an oval one 0.3 × 0.1 cm in size. The holes are punctured from the front side, and the resulting rim is forged. The front surface is polished.

The third pendant of laurel-leaf shape is ornamented by rows of punched depressions (Fig. 4, *3*). Its length is 4 cm, the width is 1.2 cm. There is an oval hole 0.25 × 0.15 cm near the upper edge. The hole, like the ornament, is made using a thin tool with a square cross-section. The ornament on the front and back sides was polished after completion, so all recesses and dents remained unprocessed.

Thus, all pendants differ in their shape, finishing, and manner of execution. They were manufactured using different tools to perform the same working operations. The pendants contained in the "cache" probably originated from various sets created by different craftsmen.

Pendants of the described type are often encountered at the Late Krotovo (Cherno-Ozerye) sites of the Baraba forest-steppe (Molodin, 2014); however, they are more typical of the Andronovo (Fedorovka) culture, in the materials of which they are very richly represented (Molodin, 1985: Fig. 54, *22*, *25*; Demin, Zaprudsky, Sitnikov, 2011: 38–39, fig. 16, *3–7*; 20, *3*; Krivtsova-Grakova, 1948: Fig. 39; Sorokin, 1960: Pl. X, *1–4*). Such pendants are generally found at the sites located to the west of Baraba; in the area to the east, they have been discovered at the Elovka-2 burial ground (Matyushchenko, 2004: 42, fig. 43, *2*, *12*). As already mentioned, adornments of this type, such as the typical bracelets, arrived in the Late Krotovo culture as far back as its early stage, owing to trade relations with adjacent Andronovo (Fedorovka) tribes (Molodin, 2014).

The bone *arrowhead* has a lancet blade with a square cross-section that passes smoothly into the tang (Fig. 5, *1*). The tip of the point is broken off. The length of the remaining portion is 10.2 cm, the width of the tang is 1 cm. The blade (of unique shape) has a cross-section of 0.9 × 1.2 cm. Similar items are available in Odinovo burials with Seima-Turbino metal pieces (Molodin, 2013: Fig. 2, *1–3*) and in classical Krotovo funerary complexes of the Sopka-2/4B, C site (Molodin, 1985: Fig. 21, *1–9*).

The whetstone is a fragment of a fine-grained arkose sandstone (Fig. 5, *2*). It has the shape of an elongated tapering bar with rounded upper lateral faces, the flattening of which is parallel to the bedding of the composing rock. Its length is 10 cm and its maximum width is 4 cm. Both ends of the tool were broken off as early as in ancient times; obviously, initially, the item was a part of a larger object, and only after damage it came to be used as an abrader.

Conclusions

The "cache" contained an assemblage of items typical of the Late Krotovo (Cherno-Ozerye) culture. Its date is beyond doubt: all dating objects belong to the period from the early to mid-2nd millennium BC. Preliminary radiocarbon dates obtained for the Tartas-1 cemetery also fit in the range from the 18th to the 14th century BC (Molodin et al., 2008; Molodin, Marchenko, Grishin, 2011).

Bronze items of the assemblage were intended for recasting. Their total weight was 162 g. The location

of local metal-working production was separated from the source of raw materials by a considerable distance, which dictated the need for arranging the delivery of raw materials. The system and character of the supply can be partly reconstructed by analyzing the composition of the "cache" from pit No. 109. It comprises a standard ingot, a sprue, and broken pieces of artifacts attributed to the Andronovo cultural circle. The composition of the "cache" points to connection between casting productions of the Late Krotovo population and of inhabitants of territories to the west and southwest of Tartas-1.

Metal was probably delivered in standard ingots and in goods, which facilitated distribution of Andronovo-type objects in the Krotovo environment, primarily among casters themselves. Arguably, this assumption can be confirmed by finding as many as three bracelets with cone-shaped ends at the casters' burial of the Tartas-1 cemetery.

It is not easy to determine the purpose of the "cache". Judging by the conditions and the place of occurrence of items, the "cache" can be considered a ritual one; however, according to its composition (ingots and broken pieces of metal), it is associated with an "artisan" or "merchandise" type of inventory, intended for further reprocessing. Obviously, it was expected that the "cache's" owner would use it the in the afterworld in exactly this manner.

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