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Hunting Equipment of Russians Living near Tara on the Irtysh in the 17th and 18th Centuries

This article describes Russian hunting tools unearthed from several sites near the town of Tara on the Irtysh: Ananyino I, Izyuk I, Tara, and Fort Bergamak. The functions of tools are assessed on the basis of archaeological parallels from the Baraba forest-steppe, ethnographic examples relating to the culture of the Irtysh natives, materials from Fort Albazin and Fort Sayansk, and much earlier burials dating to the Xianbei-Rouran time in the Altai Mountains. The variety of 17th–18th century hunting tools is best represented at Mangazeya, Fort Alazeya, and Fort Stadukhin. Apart from typological comparisons, technological analysis was carried out for several wooden and metal artifacts. Results are helpful for revealing continuities between the 17th–18th century Russian hunting tradition at Tara and that practiced in Old Rus and in the 15th–17th century Russian state, as well as for comparing it with the Siberian native traditions.

Keywords: *Russian population, Irtysh River, Tara in 17th–18th centuries, hunting equipment, bow, arrows, typology, chronology.*

Introduction

Archaeological evidence from Old Russian sites and written sources contains various information about hunting devices and methods (Tretyakov, 1951: 55, 73–75; Malm, 1956: 108–116; Medvedev, 1966: 11–12; Niederle, 1956: 322; Chernetsov, Kuza, Kiryanova, 1985: 232–233). Depending on the methods, all items and means used for hunting animals and birds are usually divided into tools for active hunting (bows, arrows, and guns) and passive hunting (snares, leghold and shooting traps, etc.) (Gerasimov, 1990: 54–58).

This research is based on archaeological evidence discovered at rural complexes of the Russians of the 17th–18th centuries in the Omsk Region (the sites of Ananyino I, Bergamak I, Izyuk I, and the town of Tara).

The village of Ananyina (the Ananyino I site in Tarsky District, Omsk Region) is one of the first Russian settlements founded near Tara. It was built on the southern shore of Lake Ananyino—an oxbow of the Irtysh. To the southwest of the settlement, there is a cemetery. This one-house village has been known from the written sources since 1624. In 2005 and 2010–2020, L.V. Tataurova researched 2320 and 684 m^2 of the area of the settlement and cemetery, respectively, uncovering 81 burials and nine housing complexes of eight three-chamber log houses and one single-chamber house (Tataurov et al., 2019: 200–204; Tataurova, 2020; Tataurova, Krikh, 2015).

The remains of the cultural layer at Fort Bergamak (the Bergamak I site in Muromtsevsky District, Omsk Region) have been found on a rock terrace above the Tara River, on the northern edge of the present-day village

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of Bergamak. The fort was built in 1668 on the border with the Baraba Tatar volosts on the left bank of the Tara River. In 1996–1998, L.V. Tataurova and S.F. Tataurov excavated 300 m^2 in the part of the site which was the most susceptible to destruction by the river. During the excavations, four buildings, as well as the remains of a cellar and wooden structures possibly associated with a fortification system, were discovered (Tataurov et al., 2019: 206–207).

The village of Izyuk (the Izyuk I site in Bolsherechensky District, Omsk Region) is located on the right bank of the Irtysh River, opposite the present-day village of Evgashchino; it was founded not earlier than the 1660–1670s. In 1999–2004, Tataurova researched the settlement and burial complexes of the site and unearthed 1805 m^2 of the area. Five out of nine excavated features were residential, including a log house, five-walled house with wooden addition, and three three-chamber log houses (Ibid.: 204–206). At the cemetery, 261 burials were examined (Tataurova, 2010).

The Tara Fortress, founded in 1594, is the first Russian fortress in the Omsk Irtysh region, located 300 km north of Omsk, on the left bank of the Irtysh River. At present, it is a district center, the town of Tara in Omsk Region. Since 2007, excavations by S.F. Tataurov and S.S. Tikhonov* have unearthed an area of over 2000 m^2. The remains of the Prince's Tower, which was a part of the fortification system, the household of a noble resident of Tara (presumably the Voevoda), shoe-making workshop, cemetery of the 18th century, foundations of St. Nicholas Cathedral, and a part of the church graveyard have been explored. Construction horizons of the late 16th–mid-20th centuries, residential and utility complexes, and wooden pavements have been discovered in the cultural layer, which was about 4 m thick (Tataurov et al., 2019: 253–392; Tataurova et al., 2014: 142–242).

The hunting tool complex at archaeological sites, as well as in ethnographic collections, is made up of a small set of items; therefore, it is very important to present such artifacts to a wider scholarly audience.

This study intends to describe the *saadak* (Russian terminology according to (Markevich, 2005: 10, fig. 22)) or bow and quiver—the set of archer's weaponry as a type of inventory for active hunting among the Russian population living in the Tara Irtysh region in the 17th–18th centuries.

The collections from Mangazeya and Forts Alazeya and Stadukhin are used as reference materials. The evidence from these sites is contemporaneous with the collections from the Tara Irtysh region and gives some idea about the material culture of the Russians in the 17th–18th centuries.

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Research materials and methods

Equipment for active types of hunting practiced by the Russian population of the Tara Irtysh region in the 17th–18th centuries includes *saadaks*, and, since the 18th century, also firearms (which are not considered in this article). Composite bows and various types of arrows from the Russian *saadak* set were used in the region.

A fragment of a wooden core (the middle part of a bow shaft) was found at the Ananyino I settlement under the flooring of a three-chamber log house, which, according to its set of things, pertains to the 18th century (Fig. 1, *1*). The core is 50 cm long; the width of the limbs at the edges is 3.7 cm and 4.0 cm, and thickness is 0.7 cm. The handle is 17 cm in length, and 1.8 cm in width and thickness.

Three types of arrows have been discovered at the settlement complexes of the Tara Irtysh region: *tomars* of solid wood, bone arrowheads, and iron arrowheads (Fig. 1, 2).

Tomars of solid wood include 3 items. One of them, from Fort Bergamak, is represented by a 60 cm long fragment. The diameter of the shaft is 1 cm. The head (point) is 6 cm long; the width of the facets is 1.9 × 1.9 cm. In Tara, the upper parts of two *tomars* of solid wood with cone-shaped heads have been found (Fig. 1, *3*, *4*) (Tataurov et al., 2019: 333). Bone socketed heads of *tomars* have also been discovered in the cultural layer of Tara (see Fig. 1, *5*).

The collection of bone arrowheads is representative and varied. Around thirty such points of various types and three blanks have been discovered at the settlements of the Tara Irtysh region; points have been also found in Tara (see Fig. 1, *6–17*; 2, *1–23*).

There are far fewer iron arrowheads on the explored Russian sites of the Tara Irtysh region (Fig. 2, *24–41*). For example, only one item has been found in Tara (Fig. 2, *25*).

During the study, the methods of comparative-typological analysis for systematizing and dating the arrowheads, technical-technological and anatomical analysis of the wooden bow core, and microstructural analysis for identifying manufacturing techniques of some iron arrowheads were used.

Description of the evidence and research results

Bows

The fragment of the bow core found in Ananyino I is not the only find related to hunting tools in the material evidence from the sites of the 17th–18th centuries in Siberia. The referential collections from Mangazeya contain parts of bow cores, *nastrugi* (specialized scrapers

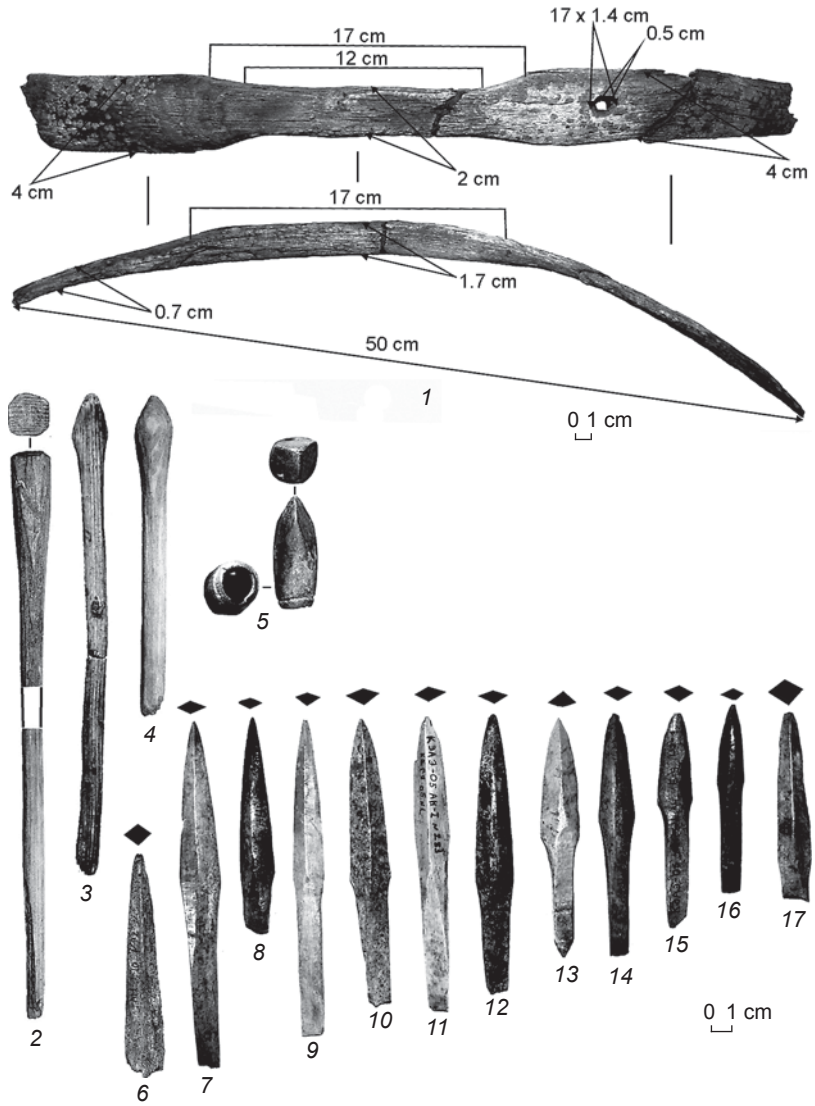

Fig. 1. Hunting equipment of Russians living in the Tara Irtysh region in the 17th–18th centuries.
1 – bow core; *2–4* – *tomars*; *5* – socketed point of a *tomar*; *6* – socketed arrowhead; *7–17* – tanged arrowheads. *1*, *6–8*, *11*, *12*, *14–17* – Ananyino I; *2*, *9* – Bergamak I; *3–5* – Tara; *10*, *13* – Izyuk I. *1–4* – wood, *5–17* – bone.

for producing arrow shafts), arrows, and protective onlays on bows (Belov, Ovsyanikov, Starkov, 1981: 74, pl. 64; Vizgalov, Parkhimovich, 2008: 62–63, Fig. 85, *4*; 2017: 94, 163, 177, etc.). The material evidence from Fort Stadukhin contains cores of composite bows, end inserts and *nastrugi* scrapers; that from Fort Alazeya includes protective shields made of horn (Alekseev, 1996: 41–42).

A bow core similar in shape to the find from Ananyino I appears in the collection of finds from the Tatar cemetery of the 16th–18th centuries at the Abramovo-10 site in Baraba (Molodin, Sobolev, Solovyev, 1990: 13, 46–47). The design of these bows is typical of the indigenous peoples of Siberia both in the time preceding the arrival of the Russians and in the subsequent period up to the early 20th century (Simchenko, 1976: 132–133; Solovyev, 1987: 25–27; Molodin, Sobolev, Solovyev, 1990: 47–48; Remeslenniye protsessy…, 2011).

In the Late Middle Ages, bows were made of various types of wood.

According to the analysis of the anatomical wood structure, the bow core from the settlement of Ananyino I was made of cedar pine (*Pinus sibirica* Du Tour*).

Technical and technological analysis of the bow core from Ananyino I has made it possible to recreate the process of its manufacturing. Judging by the anatomical structure of the wood, the core was made of a young cedar trunk 6–7 cm in diameter. The timber was harvested in the late autumn or late winter when a minimal amount of natural moisture remained in the tree trunk. The basis of the future weapon was made soon after harvesting the wood, while it was soft and pliable, and was easier for processing. The bow was carved using the blade of a sharpened knife. First, the limbs were formed, then the handle. Wood from the inner planes of the limbs was removed with small, frequent movements, cutting off thin shavings. The chipping of each limb was carried out evenly, symmetrically, with a decrease in thickness from the beginning of the handle to the ends of the reflective planes. At the end of each limb, at a distance of 3–4 cm, small oblique grooves were cut for attaching the bowstring. The handle for the hand of the archer was shaped after completing the limbs. The wood was cut symmetrically on all sides, so it would be as comfortable as possible to be held by the archer's closed hand. After the handle was made, the artisan gradually brought the bow limbs to optimal parameters by periodically checking their flexibility and elasticity. Then the blank without the bowstring was dried to some equilibrium humidity in the open air, avoiding direct sunlight, which negatively affected the flexibility of the product.

*Identification of wood species was made by I.Y. Slyusarenko, for which the authors express to him their gratitude.

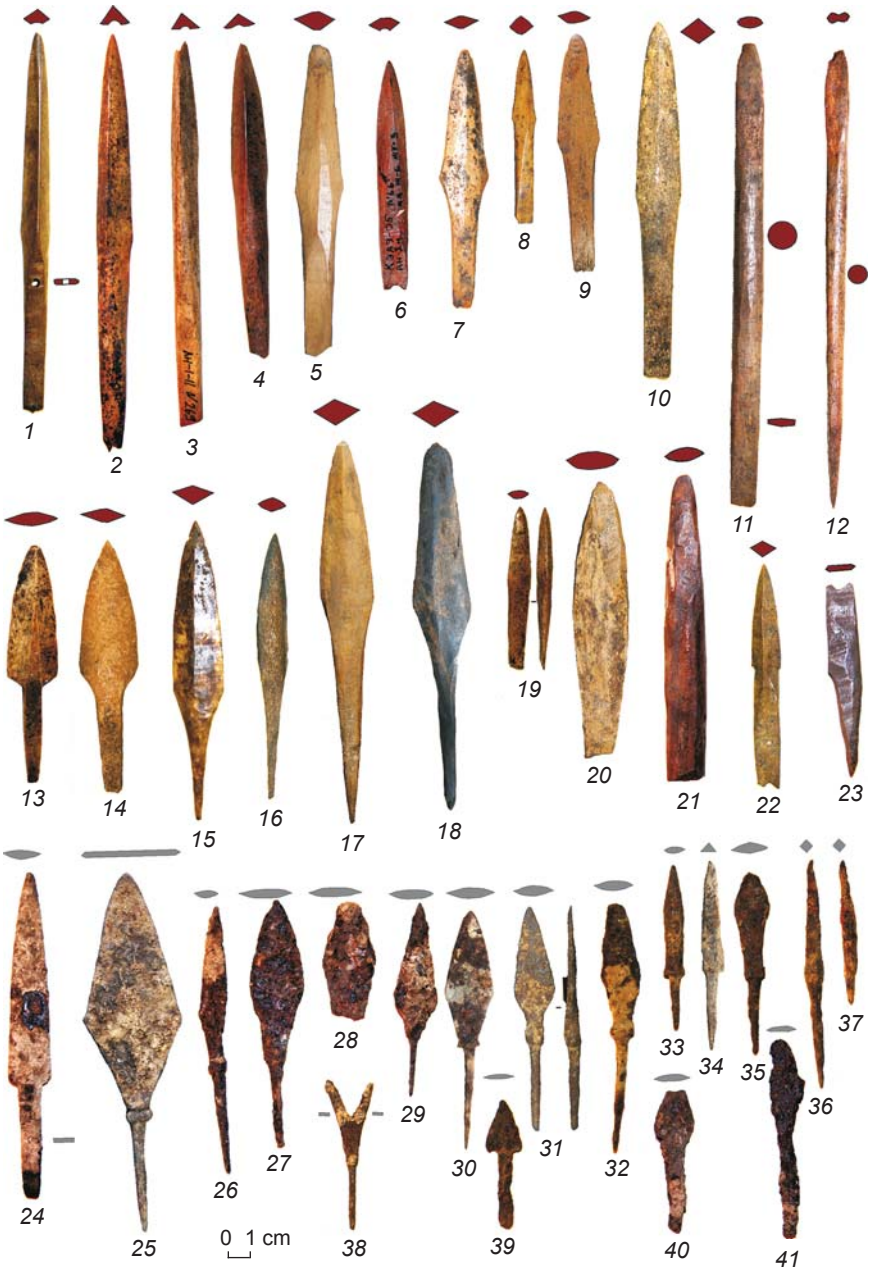

Fig. 2. Tanged arrowheads of Russians living in the Tara Irtysh region in the 17th–18th centuries.
1–4, *6*, *7*, *10–16*, *19–24*, *26*, *27*, *30*, *31*, *34*, *36*, *37*, *39*, *40* – Ananyino I; *5*, *8*, *9*, *17*, *18*, *25* – Tara;
28, *29*, *32*, *33*, *35*, *38*, *41* – Izyuk I.
1–23 – bone, *24–41* – iron.

In our opinion, the bow that was found in the dwelling was an original weapon, and not a copy. Since the bow core was found under the flooring, it can be assumed that the weapon (perhaps already unfit for use) was placed there specially as a talisman to protect the home.

In the Tara Irtysh region and in other regions of Siberia, in the 17th–18th centuries, the *saadak* sets were used not only by hunters, but also by service people. A similar bow may be represented in a pictorial reconstruction of the appearance of a service Cossack from Fort Albazin (Bagrin, Fomin, 2019: 234, fig. 2.7.5). A fragment of the bow core of such a weapon is a part of the collection from that site (Mylnikov, 2019: 288, fig. 2.11.3, *2*).

In terms of anatomical structure, shape, and design, the find from Ananyino shows similarities with the bow core with remains of reflective limbs from kurgan 31 of the Xianbei-Rouran period at the Yaloman II cemetery in the Altai Mountains (Tishkin, Mylnikov, 2016: 57–58, fig. 72). Additional information on its manufacturing technique was provided by the reconstruction based

on the finds from kurgan 31 by G.L. Nekhvedavichus (Ibid.: Fig. 73).

The bows from Mangazeya and Forts Alazeya and Stadukhin differ from the bow from Ananyino. The Mangazeya bows have wide (from 5.6 to 6–6.5–7.8 cm) reflective limbs, indicating a greater lethal force of the weapon, and handles with different design (Belov, Ovsyanikov, Starkov, 1981: 74, pl. 65; Vizgalov, Parkhimovich, 2008: 62; 2017: 94, fig. 42, *3*). The bows from Forts Alazeya and Stadukhin (Alekseev, 1996: 41–42, pl. 58, *4*) belong to the Yakut type of Eastern Siberian composite bow (Simchenko, 1976: 114, 116, fig. 7). The Yakut bow, like Western Siberian bows, was made of two types of wood, but the end plates of bone (from reindeer antler in the Forts) were glued into slits in the middle of the ends of the limbs (Ibid.: 133, fig. 7; Alekseev, 1996: Pl. 58, *4*). In Western Siberian bows, "the curved end was glued with its wedge-shaped part between the plates which form the back and inner part of the bow" (Simchenko, 1976: 133).

In addition to these items, the material evidence from Mangazeya contains a leather bow case with embossed ornamentation (Belov, Ovsyanikov, Starkov, 1981: 74–75); six quivers with arrows were found in Tobolsk (Matveev, Anoshko, 2019: 70, fig. 3, *3*).

Scholarly literature contains information that sets of bow and quiver in 1655/56 were sold for 1.5 rubles per piece at the Tobolsk marketplace (Vilkov, 1967: 95).

Arrows

Tomars. Whole *tomars*, similar in shape to those from the Irtysh region, with bowstring earlets at the end, are known from the evidence of Mangazeya (Vizgalov, Parkhimovich, 2008: 202, fig. 86, *5*, *7*) and Verkhoturye (the length of the item is 42 cm) (Korchagin, 1998: 69, 73). Solid wood *tomars* of other shapes, bone *tomar* heads, arrow shafts, bone and iron arrowheads of various types, and arrow balance weights have also been found in Mangazeya.

The collections from Forts Stadukhin and Alazeya include *tomars* of three types: those made of solid wood, those made of bone with flat working parts, and those with lobed working parts. In addition, there are bone *tomar* heads, other (mainly tanged) arrowheads made of bone (eight types) and iron (three types), and arrow shafts (Alekseev, 1996: 42–43, pl. 61). *Tomar* tips have been found in Tomsk (Chernaya, 2015: 248, fig. 149), Tobolsk (Adamov, Balyunov, Danilov, 2008: 66, fig. 33, *8*, *9*; Balyunov, 2014: Vol. 1: 84–85; vol. 2: 5, pl. 3), and Berezovo (Vizgalov, Kardash, 2012: 155).

On the basis of the evidence from the sites of Old Rus, five types of bone *tomar* tips have been identified. Their emergence is associated with the 10th–12th centuries (Medvedev, 1966: 87–88, pl. 22, 25, 30). According to the typology by A.F. Medvedev, the socketed bone arrowhead from Tara belongs to type 5, or blunt, massive arrowheads (Ibid.: 87, pl. 30, *106*), dating to the 10th–14th centuries.

Tomars were used for hunting fur animals.

Bone arrowheads. Scholars have proposed several classifications of bone arrowheads from the Russian sites of the Middle Ages and Modern period: for Old Rus (Ibid.: 88–89); for Forts Alazeya, Stadukhin, and Sayansk (Alekseev, 1996: 42–43, pl. 62–65; Skobelev, 2002), and for Tobolsk (Balyunov, 2014: Vol. 1: 84–85; vol. 2: 5, pl. 3).

The typology of bone arrowheads from the complexes of the indigenous population of the 16th–18th centuries (Molodin, Sobolev, Solovyev, 1990: 56–62) served as a basis for analyzing evidence of the Turkic population of the Tara Irtysh region, carried out by A.V. Shlyushinsky (2007: 129–133). Comparison has revealed similarities between the collection of arrows from the Russian complexes and from the sites of the indigenous population of Siberia. We used the same model. Two types of arrowheads were distinguished according to the shape of their bodies.

Class I – socketed arrowheads. There is one diamond-shaped tetrahedral, and pyramidal item from Ananyino I, measuring 10.0 × 1.8 cm. This arrowhead can also be attributed to type III (Fig. 1, *6*).

Class II – tanged arrowheads. It includes all other arrowheads analyzed in this article (Fig. 1, *7–17*; 2, *1–23*). Most of them can be described as group 3 (diamond-shaped), types I and VI.

Type I – elongated rhombic arrowheads (12 items). The sides of the blades vary from straight to slightly convex.

Variant 1 – the penetrating part prevails over the bearing part. There are three items—one item from each basic site (Fig. 1, *9*, *10*, *12*). Their sizes are 14.0 × 8.0 × × 1.5 cm; 12.7 × 7.0 × 1.8 cm, and 12.4 × 7.2 × 1.6 cm. It is possible that two more broken arrowheads from Ananyino I belong to this variant. The blade is 8.2 and 8.0 cm long, and 1.5 cm wide (see Fig. 1, *8*, *17*).

Items of similar shape are known from the evidence of Fort Sayansk and Tobolsk (Skobelev, 2002: Fig. 1, *14*; Adamov, Balyunov, Danilov, 2008: Fig. 33, *5*), and from the indigenous population of the Tara Irtysh region and Baraba (Shlyushinsky, 2007: Fig. 69, *28*, *31*; Molodin, Sobolev, Solovyev, 1990: 56–63).

Variant 2 – the penetrating part is less than or equal to the bearing part. Six items are from the settlement of Ananyino I, and one item from Izyuk I (see Fig. 1, *7*, *11*, *13–16*). The length of the arrowheads from Ananyino I varies from 15.4 to 8.3 cm; the length of the penetrating part ranges from 7.2 to 3.5 cm; the blade width ranges from 1.8 to 1.2 cm. The size of the arrowhead from Izyuk I is 10.0 × 5.5 × 1.8 cm.

Similar items appear among the evidence of the Turkic population in the Tara Irtysh region (Bolshoi Log, Okunevo VII) and the sites of Baraba (Shlyushinsky, 2007: Fig. 69, *32–34*; Molodin, Sobolev, Solovyev, 1990: 56–63).

Type VI – oblong-rhomboid arrowheads with concave sides and shoulders. Arrowheads of this type include two variants in the evidence from the Tara Irtysh region.

Variant 1 is the classical form, which served as the basis for identifying the type (Molodin, Sobolev, Solovyev, 1990: 58–59, fig. 45, *4*, *5*). The arrowhead from Ananyino I (Fig. 2, *7*) measures 11.5 × 5.6 × 2.2 cm.

Variant 2 – massive long bases and bodies almost equal in width with the bases. There are two items from Tara (Fig. 2, *8*, *9*), measuring 8.0 × 3.5 × 1.0 cm and 10.0 × 4.7 × 1.6 cm. Sub-variant 1 is the arrowhead from Ananyino I, measuring 15.1 × 7.5 × 1.9 cm, which has a massive, long tang and even (not concave) blade smoothly passing into the base (Fig. 2, *10*).

Group 4 – flattened hexagonal arrowheads.

Type II – elongated rhombic arrowheads; both planes are flattened. One item is from Tara and one is from Ananyino I (Fig. 2, *5*, *6*). They differ in size and measure 13.8 × 6.6 × 2.1 cm from Tara and 9.3 × 1.3 cm from Ananyino I. The latter arrowhead has no clear boundary between the body and base; the edges of the body disappear when passing into the base.

Type III differs from the described arrowheads (Molodin, Sobolev, 1990: 58–59) by only one flattened side with a medullary cavity (Fig. 2, *1–4*). The length of the body is equal to the length of the base. In one case, the blade is indicated only by facets, which disappear when passing into the base (Fig. 2, *3*). The sizes vary from 14.0 × 6.0 × 1.6 cm to 19.0 × 9.5 × 1.8 cm.

There is a hole on the tang, below the border with the blade (Fig. 2, *1*), on one item of this type, which measures 16.1 × 9.5 × 1.3 cm. This makes it possible to identify this point as a projectile for a shooting trap.

Group 7 – rod-shaped arrowheads (Fig. 2, *11*, *12*).

Type II – awl-shaped arrowheads. They were identified using the evidence from Forts Alazeya and Stadukhin (Alekseev, 1996: 42–43, pl. 62, 63). In the collection from the Russian sites of the Tara Irtysh region, this type appears in two variants. There are no arrows like these in the collections of the indigenous population of the region.

Variant 1 (type I according to A.N. Alekseev (Ibid.: 42)) has a pointed working part. It consists of a long (21.5 cm) rod-like point, rounded (1.5 cm) in cross-section (Fig. 2, *11*).

Variant 2. *S*ub-variant 1 (identified in the Irtysh region) is an arrowhead with a pronounced, scapular body, hexagonal in cross-section, in the center rounded in cross-section, with an awl-shaped base (Fig. 2, *12*). The size is 21.0 × 5.0 × 1.2 cm.

About seventy arrowheads of this type have been found in Forts Alazeya and Stadukhin. In Mangazeya, similar arrowheads have pronounced facets (Vizgalov, Parkhimovich, 2008: Pl. 87, *1*, *2*). A similar arrowhead appears in the Tomsk evidence (Chernaya, 2015: 149, fig. 159, *8*).

Among the bone arrowheads found at the Russian sites of the Tara Irtysh region, in addition to awl-shaped arrowheads, four new types can be distinguished that do not appear at the sites of the indigenous population.

Type 1 – keeled arrowheads with a flat tang. These items correspond to Old Russian bone arrowheads of type 11 according to the classification of A.F. Medvedev (1966: 88, pl. 30, *107*), and include two items from Ananyino I and two items from Tara. The "classical" arrowhead from Ananyino I, measuring 12.8 × 7.0 × 2.2 cm, has a diamond-shaped body, in cross-section longer than the base (see Fig. 2, *15*).

Three other arrowheads are variations of this type.

Variant 1 – keeled arrowheads with flat tang without shoulders. In one item, the blade smoothly passes into the base; the body and base are equal in length (Fig. 2, *16*). Its size is 11.3 × 6.0 × 1.4 cm. This item was found in Ananyino I.

Variant 2 – keeled arrowheads with flat tang; the body is shorter than the base; the blade is diamond-shaped in cross-section (see Fig. 2, *17*, *18*). The sizes of the items are 17.0 × 7.5 × 2.3 cm and 16.6 × 7.4 × 2.5 cm. Two of them were found in Tara. According to Medvedev, arrowheads of this type were widespread in Russia in the 13th century (1966: 88).

In the Siberian evidence of the Modern period, such arrowheads are compared with iron arrowheads of type 15 – elongated triangular without support, according to the classification by A.I. Solovyev (1987: 38), which, in turn, correlate with the typology of iron arrowheads of Medvedev – type 46, diamond-shaped arrowheads of the Novgorod type (1966: 67, pl. 30, *42*).

In addition to sites of the indigenous population, metal arrowheads of this type are known from Mangazeya (Solovyev, 1987: 38; Belov, Ovsyanikov, Starkov, 1981: Pl. 67, *14*). They correspond to type 7 – rhomboid-wedge-shaped arrowheads, in the typology proposed by O.V. Dvurechensky (2007: 285). Their iron prototypes existed until the second half of the 17th century in the European part of Russia and until the period of ethnographic modernity in Siberia (Solovyev, 1987: 38).

Type 2 – triangular, flat arrowheads of bone. There are two items from Ananyino I, measuring 11.1 × 6.3 × × 2.7 cm and 9.8 × 6.0 × 2.0 cm (Fig. 2, *13*, *14*). The body is diamond-shaped in cross-section and is longer than the base; the facets are convex; the shoulders are well defined.

In the typology of metal arrowheads elaborated by Dvurechensky, this shape corresponds to type 16 – triangular, flat, dissecting, and wide-lobed arrowheads

(2007: 288, fig. 15). According to Dvurechensky, iron points of this type have been found in Koporye, Pskov, Moscow, and Siberian towns, such as Old Kungur (Ibid.: 288). Iron arrowheads of similar shape are known from the evidence discovered in Mangazeya (Belov, Ovsyanikov, Starkov, 1981: Pl. 67, *14*; Vizgalov, Parkhimovich, 2008: Fig. 89, *7*).

Type 3 – sub-rhomboid, flattened arrowheads with elongated oval-shaped short base, named by analogy with the evidence from Fort Sayansk (Skobelev, 2002: 180–181, fig. 1, *11*). There are two items from Ananyino I, measuring 7.2 × 4.0 × 1.0 cm and 11.0 × 2.3 × 1.8 cm (Fig. 2, *19*, *20*). One of them is an unfinished product or broken blank (Fig. 2, *20*). Similar arrowheads appear among the finds from Mangazeya (Vizgalov, Parkhimovich, 2008: 63, 203, fig. 87, *3*; 2013: 27, fig. 13, *3*), as well as Forts Alazeya and Stadukhin (Alekseev, 1996: 42, pl. 58, *3*; 59, *5*).

Type 4 – wide, sharp-leaved, tetrahedral arrowheads represented by a bone point from Ananyino I (Fig. 2, *22*), measuring 9.5 × 4.3 × 1.3 cm. No close parallels to this item are known. In terms of the shape of the body with barbs and wide base, the points of type 20 are the most similar to it among iron arrowheads, according to the classification of Dvurechensky (2007: 291, fig. 17, *36*). A similar iron item was found in Mangazeya (Belov, Ovsyanikov, Starkov, 1981: Pl. 67, *11*). Yet, with iron arrowheads, the blade is triangular and shorter, like in the iron point discovered in Ananyino I (Fig. 2, *39*). A bone arrowhead has been found at a Khanty cultic complex near Fort Kazym, which was similar to the iron arrowheads and to the Ananyino arrowhead (Kazymskiy arkheologo-etnograficheskiy kompleks, 2018: 97, fig. 119). Two bone items from Ananyino I (Fig. 2, *21*, *23*) can be considered blanks.

Bone arrows were used for a long time over a wide area. They were in demand for hunting and warfare (Molodin, Sobolev, Solovyev, 1990: 62–63).

Iron arrowheads (Fig. 2, *24–41*). The collection is based on the typology by A.I. Solovyev (1987: 35–49). The same classification was used by the researchers of Mangazeya (Vizgalov, Parkhimovich, 2008: 63–65). The types of arrows from the Russian sites of the Tara Irtysh region were compared to those from the sites of Old Rus and the Russian State of the 15th–17th centuries, which made it possible not only to examine the finds on a regional scale and compare them with the items of the indigenous population, but also to trace the connection with the shared Russian culture.

The material evidence from the Russian sites of the Tara Irtysh region contains not all of the types and variants of arrowheads indicated in the typology by Solovyev, so we will mention only those items which appear among our finds.

All *metal projectiles* from the region in period under consideration are a part of group III—flat tanged arrowheads (Solovyev, 1987: 37).

Type 16 – combat arrowheads with a support. There are three items: two from Izyuk I and one from Ananyino I (Fig. 2, *33–35*).

Variant 1 are arrowheads with a diamond-shaped body. One of those items measuring 6.3 × 4.5 × 0.9 cm is from the Izyuk I site, and another one measuring 8.2 × 5.4 × 0.7 cm is from Ananyino I (Fig. 2, *33*, *34*). According to the typology of Dvurechensky, they belong to type 1 – awl-shaped and faceted, variant 1b – square or rhombic in cross-section with a simple support (2007: 282, fig. 5, *20*). Among the Old Russian items, they are parallel to the arrowheads of type 90, according to the classification by Medvedev, which are dated to the period from the beginning of the Common Era until the 14th century (1966: 83). According to Dvurechensky, such armor-piercing points with a perforating effect were in use until the second half of the 17th century (2007: 282).

Variant 3 – arrowhead with a wide, rhomboid body. There is one item measuring 7.5 × 4.5 × 1.5 cm from the Izyuk I site (see Fig. 2, *35*). Such arrowheads were in use until the second half of the 17th century (Dvurechensky, 2007: 286). Among Old Russian material evidence, there are similarities with the items of type 51 (Medvedev, 1966: 65).

Solovyev believed that arrowheads of this type reached different regions of Siberia before the arrival of the Russians and were in use in the southern regions including Tuva before the ethnographic period (1987: 38).

Type 17 – combat arrowheads without a support. There are two items from Ananyino I (Fig. 2, *36*, *37*), measuring 9.5 × 5.0 × 0.7 cm and 6.0 × 3.5 × 0.6 cm. In the Tara Irtysh region, such arrowheads have been found at the Bergamak II cemetery (Shlyushinsky, 2007: Fig. 67). According to Solovyev, items of this type were typical of the forest population of the region; the scholar dated them to the last centuries of the first millennium AD to the 17th century (1987: 38–39).

Type 18 – combat arrowheads with spikes. *Variant 1* – small. There is one item from Ananyino I (Fig. 2, *39*), measuring 5.3 × 2.0 × 1.5 cm. Such points are known from Mangazeya (variant 2) (Belov, Ovsyanikov, Starkov, 1981: Pl. 67, *11*) and Baraba (group 1, type III) (Molodin, Sobolev, Solovyev, 1990: 50). In the typology of arrowheads of Muscovy and the Russian State of the 15th–17th centuries, they correspond to type 20 – two-spike arrowheads (Dvurechensky, 2007: 291–292, fig. 17). Among the Old Russian evidence, this type is similar to type 29 – two-spike arrowheads without a support, which existed from the beginning of the Common Era until the 14th–15th centuries (Medvedev, 1966: 62), and are later known only from Mangazeya.

Most of the arrowheads from the Russian collection of the Irtysh region (8 items) belong to ***type 20*** – large rhombic arrowheads with a support (see Fig. 2, *25–32*).

Variant 1 – wide arrowheads. One item from Tara (Fig. 2, *25*) measures 16.0 × 10.5 × 4.4 cm. In the evidence from Baraba, the arrowheads of this variant represent type XIII – diamond-shaped, of the "Gnezdovo type", with convex sides and concave shoulders (Molodin, Sobolev, Solovyev, 1990: 50). The Tara arrowhead is larger than the Baraba finds.

Variant 2 – narrow arrowheads. There are four items from Ananyino I (from 9.7 to 11.0 cm long; the length of the body ranges from 4.5 to 6.5 cm and width from 1.4 to 2.3 cm) (Fig. 2, *26*, *27*, *30*, *31*), and three items from Izyuk I (10.0 × 5.0 × 1.5 and 8.0 × 5.0 × 1.7 cm, with the body 4.7 cm long) (Fig. 2, *28*, *29*, *32*).

According to Medvedev, arrowheads of this type (type 41 in his classification) were widespread in Russia from the 8th until the 14th century (1966: 65). In Western Siberia, they are known from the materials of Mangazeya (Vizgalov, Parkhimovich, 2008: 64, 205, fig. 89, *5*) and among the indigenous people, for example, those living in Baraba (Solovyev, 1987: 39; Molodin, Sobolev, Solovyev, 1990: 50). In the Tara Irtysh region, such arrowheads appear among the Late Medieval material evidence from the Okunevo archaeological area, and were dated to the 17th century (Shlyushinsky, 2007: Fig. 67; Matyushchenko, Polevodov, 1994: 198). Solovyev dated them to the 17th–18th centuries (1987: 39).

Taking into account the parallels and dimensional features of the bodies, the arrowheads of type 20, variant 2 (narrow) from the settlements of Ananyino I and Izyuk I can be dated to the 17th century.

Type 47 – stepped arrowheads, flattened-rhombic in cross-section. There are two items, one from Ananyino I and one from Izyuk I (Fig. 2, *40*, *41*), measuring 6.5 × 3.0 × × 1.7 cm and 8.2 × 4.0 × 1.5 cm. Items of similar shape have been found in Mangazeya: type 2 with a triangular blade and subtype 2 with a steep ledge at the base of the blade, measuring 5.8 × 2.5 × 1.8 cm (Vizgalov, Parkhimovich, 2008: 64, 205, fig. 89, *7*). In Medvedev's typology, this type is called "sharp-leaved". In the collections from the sites of Eastern Europe, arrowheads of this type were dated to the 11th–14th centuries (Medvedev, 1966: 73, pl. 12, *41*). In the Tara Irtysh region, they appear among the evidence from Okunevo VII (Shlyushinsky, 2007: Pl. 67, *27*). Solovyev established the time when they were in use as being the 17th–18th centuries (1987: 44).

Another iron point from the Izyuk I site belongs to ***type 42*** – forked splay-bladed arrowheads (Fig. 2, *38*). *Variant 1* has concave lateral and convex cutting edges (see (Solovyev, 1987: 43)). According to Dvurechensky, these are splay-bladed arrowheads of type 19, but there was no such variant in his classification. Such items are dated to the 10th–11th centuries. Dvurechensky also observed that at a later period they appeared only in Mangazeya (2007: 289, 291). The size of the find from Izyuk I is 6.0 × 3.5 × × 1.9 cm. Similar splayed arrowheads of the first and other variants were used by the Mangazeya dwellers (Belov, Ovsyanikov, Starkov, 1981, pl. 67, 1, *1*; 5, *7*; Vizgalov, Parkhimovich, 2008: 64, 204, fig. 88, *2*). Such items appear among the evidence from Fort Sayansk (Skobelev, 2002: Fig. 1, *3*) and the sites of the indigenous population of Baraba (Molodin, Sobolev, Solovyev, 1990: 53).

Splay-bladed arrowheads were used for hunting birds and animals, and for military operations in the 10th–14th centuries (Medvedev, 1966: 73; Dvurechensky, 2007: 289, 291). According to Solovyev, they were in use from the 6th until the 19th centuries; their bone imitations have also been discovered (1987: 43).

Microstructural analysis of the splay-bladed arrowhead (Fig. 2, *38*) and rhombic point of type 20, variant 2 (Fig. 2, *32*) from Izyuk I has revealed that the former arrowhead was made using the technique of welding two strips of iron and steel, while the latter arrowhead was forged entirely of raw steel (Zinyakov, 2005: 279, 289).

One iron arrowhead from Ananyino I site does not appear among the evidence of the indigenous population of Western Siberia (see Fig. 2, *24*). Its size is 13.5 × 8.6 × × 1.7 cm. In terms of shape of the body, the arrowhead is similar to type 38 (keeled, variant 4). Medvedev associated that variety with the Mongolian influence and dated it to the 13th–14th centuries (1966: 64, pl. 23, *18*). The tip of variant 3 of this type appears in the collection from Mangazeya, having a tang, like in the item from Ananyino I, but smaller, with triangular shoulders drooping downward (Vizgalov, Parkhimovich, 2013: 26, fig. 12, *4*).

Conclusions

Analysis has shown that the studied hunting equipment was traditional both for the Russian and indigenous population of the Tara Irtysh region of the 17th–18th centuries, the adjacent territories, and Siberia as a whole. Some types of items find parallels only among the evidence from the European part of Russia, which indicates the continuity of links and uninterrupted tradition of Russian Siberian culture.

Technical-technological and comparative typological analysis has revealed that the bow core from the Ananyino I settlement was almost identical in form and manufacturing methods to the core from kurgan 31 of the Xianbei-Rouran period (3rd century BC–5th century AD) at the Yaloman II cemetery, in the Altai Mountains. This means that the traditions of selecting raw materials and specific methods of manufacturing certain types of hunting tools were rooted in the distant past of Siberia. According to scholars, hunting tools similar in structure and purpose were common among the majority of the peoples of Siberia. Their design reflects the experience of the indigenous population and Russian settlers (Minenko, 1991: 146–147, 154; Korovushkin, 1997; Tyurki…,

1991: 42–51; Ryndina, 2003: 78–80; Vizgalov, 2005: 98; Selkupy, 2013: 77–87; and others). This observation is also confirmed by the written sources (Lepekhin, 1771: 30–34; Patkanov, 1999: Vol. 1: 56–59; vol. 2: 138–144; and others). In hunting practice, such items have been in use since the Late Middle Ages up to the present time among the Russian and indigenous population (Korovushkin, 1990, 1993, 1997; Ryndina, 2003; Kosintsev, 2006; Shukhov, 1928: 114–119; and others).

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