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The Middle Paleolithic of the Levant*

This study explores the origin and development of the Middle Paleolithic in the Levant—a region critical for understanding the dispersal of anatomically modern humans. The technological and typological features of the regional Middle Paleolithic industry indicate its distinctiveness, opposing it to other contemporaneous industries of Africa and Eurasia. Some peculiarities concern reduction techniques relating to the emergence and spread of the Levallois and blade technique, which had local Acheulo-Yabrudian roots. The Levantine Middle Paleolithic industry was associated with both anatomically modern humans and Palestinian Neanderthals, who had originated during the Middle Pleistocene from a taxon that was an outcome of hybridization between Homo heidelbergensis and local archaic hominins.

Keywords: *Acheulo-Yabrudian industry, Middle Paleolithic, Mousterian, Pleistocene, Levallois, blade industry, H. heidelbergensis, H. neanderthalensis, H. sapiens.*

Introduction

In the Near East, the Levantine Middle Paleolithic is the best-studied period, and has been investigated by many renowned European and American scientists. This has had a great positive impact, as the field research carried out at deeply and well-stratified cave- and open-air sites has resulted in a rich array of data, with subsequent summarization in large monographic studies and hundreds of publications. But a negative implication is that finds originating from the same localities are scattered across scientific institutions in different countries; and it appears that some are now lost forever. The fate of Ksar Akil, a unique open-air site studied by different researchers, may serve as a sad example. Its richest collections are housed in various research establishments, but it is quite likely that some artifacts have been lost (Marks, Volkman, 1986).

In this paper, we have analyzed the published data obtained from research works focused on the Levantine Middle Paleolithic, and drawn up hypotheses on the key aspects of cultural genesis and anthropogenesis in the area at issue. While drawing general conclusions, we proceeded from the basic assumptions as follows. The Levantine Middle Paleolithic showed a fundamental difference from the African Stone Age and the European Mousterian. Its origins come from the Acheulo-Yabrudian industry, therefore it is necessary to avoid using such a term as the "Levantine Mousterian". The Mousterian industry was developed by European Neanderthals. In the Levant, during the Middle

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Pleistocene*, an evolutionary process appears to have occurred with the arrival of *H. heidelbergensis*, resulting in the formation of *H. sapiens* (Skhul and Qafzeh) and Palestinian Neanderthals (Amud, Kebara, Tabun).

Archaeological aspect

The Levantine Middle Paleolithic technocomplexes are found to be the striking and original ones among African and Eurasian lithic industries. This particular feature has been emphasized by many researchers (Bar-Yosef, 2006; Hovers, Belfer-Cohen, 2013; and others). D. Garrod, one of the first scientists who studied the Middle Paleolithic of Israel, had recognized a lithic industry associated with Layers D, C, and B in Tabun Cave, including both the Levallois artifacts and implements that were typologically close to the Mousterian retouched tools. She identified this industry as the Levalloiso-Mousterian, distinguishing Lower Levalloiso-Mousterian (Layers D, C), which included triangular flakes and elongated blanks, as well as abundant stone tools of Upper Paleolithic types; and Upper Levalloiso-Mousterian (Layer B and the inner chamber), with numerous scrapers and rather scarce Levallois points (The Stone Age…, 1937). Moreover, both earlier and later materials constituted a certain unity in terms of technology, and differed from European collections dating to the same time period. Garrod's opinion with regard to the classification of the Levantine Middle Paleolithic was supported by the majority of scientists until the late 1940s, and her technical approach towards the study of lithic industries is still used today. Since the 1950s, researchers have referred to the Levalloiso-Mousterian as the Levantine Mousterian.

L. Copeland divided the Levantine Middle Paleolithic into three stages: Tabun D, C, and B, according to the major stratigraphic sequence in Tabun Cave, which is considered a unique Paleolithic site, with evidence showing continuity in the development of lithic industries from the Acheulean to the final Middle Paleolithic (1975). This, of course, does not rule out the possibility of long hiatuses in sedimentation and human occupation of the cave.

It is important to note that blades and stone tools of Upper Paleolithic types are found sporadically throughout the whole stratigraphic sequence of the deposits. The lower layers (G and F) yielded Tayacian industry of the advanced Acheulean; the overlying Layer E revealed non-Levallois blades, in association with the Acheulo-Yabrudian industry with bifacial tools; the upper layers of the cave (D, C, B) were dated to the Middle Paleolithic (Monigal, 2001).

The analysis of stone implements, conducted by researchers who study the Levantine Middle Paleolithic, is based mainly on their technological characteristics. A. Marks draws attention to the fact that in the process of typological analysis, all investigators recognize certain types of tools (single scrapers, end-scrapers), and note differences between backed knives and poorly retouched scrapers. However, such stone tools as recloirs, pseudo-Levallois points, denticulates and Mousterian tranchets cannot always be identified, and not all researchers include them in the typological lists. The technological characteristics of these tools are more indicative than their typological classifications (Marks, 1992).

The Levantine Middle Paleolithic holds a special place among Paleolithic industries dating to the latter half of the Middle and the earlier half of the Late Pleistocene. Firstly, there was a permanent overland passage between the Levant and Africa that could have been easily used by human and animal populations for migrating. Secondly, significant changes in environmental conditions during the period 400–50 ka BP appear to have determined the frequent changes in adaptation strategies, and enabled the emergence of innovations (or the recurrence of old techniques) in primary and secondary lithic reduction. Thirdly, environmental fluctuations caused migrations both within the Arabian Peninsula and beyond. Fourthly, the Paleolithic of the Levant—particularly that of Israel—is one of the best-studied in Eurasia. Fifthly, two taxa (anatomically modern humans and the Palestinian Neanderthals) inhabited the Levant during the Middle Paleolithic.

The Middle Paleolithic layers in Tabun Cave have been dated by different methods, and there are quite a lot of age determinations for them (Table 1). There are also other dates obtained for deposits in Tabun Cave (apart from those given in the table). Considering the age determinations for other localities discovered in the area, the Levantine Middle Paleolithic stages can be dated as follows: early—260 (250)–165 (150) ka BP, middle—165 (150)–100 (90) ka BP, and late—100 (90)–55 (50) ka BP.

The early stage in the development of the Levantine Middle Paleolithic industry is characterized by a high index of blades, elongated points, and a great variety of Upper Paleolithic tools (burins, end-scrapers, borers, truncated pieces, and backed knives) that occur in combination with scrapers of various modifications and

*We here consider the Pleistocene to be as defined by the timeframe of European chronology. The division of MIS 5 is given according to the publications of scientists indicated in references, where letter and digital symbols are used for designating periods.

Table 1. **Dates for Tabun Cave, ka BP***

Layer (after Garrod)	Subdivision by Jelinek	EU-, ESR-dates (average values)	LU-, ESR-dates (average values)	Averaged date (ESR- and US-methods)	TL-date (average values)	Sedimentary material
Crevice	–	–	–	–	–	Red soil
B	–	82 ± 14	92 ± 18	90^{+30}_{-16}	–	Soil
		102 ± 17	122 ± 16	104^{+33}_{-18}		
C	I	120 ± 16	140 ± 21	135^{+60}_{-30}	165 ± 16	"
D	II	133 ± 13	203 ± 26	143^{+41}_{-28}	196 ± 21	Silt
	V	–	–	–	222 ± 27	"
	IX	–	–	–	256 ± 26	"

*After: (Zviely et al., 2009).

notched-denticulate tools, which were more typical of the Middle Paleolithic; some types of artifacts were found to be characteristic of the Acheulo-Yabrudian industry.

L. Meignen, with consideration for her own models of *chaîn opératoire* and E. Boëda's reconstructions (1995), classifies the Middle Paleolithic cores into two groups: the first was intended for manufacturing elongated blanks (blades and points), and the second included relatively elongated blanks (blades and elongated flakes) (Meignen, 1994, 2000). The early stage of the Levantine Middle Paleolithic is characterized mostly by the primary reduction technique, which can be traced in evidence recovered from Tabun D, Rosh Ein Mor (Marks, Monigal, 1995), Hayonim, and Abu Sif (Meignen, 1998, 2000; and others). The lithic industry with a high blade index (Fig. 1) is typical of these, and other, sites located in littoral and peripheral areas of the Levant. Lithic assemblages from the Early Levantine Middle Paleolithic are dominated by convergent single-platform, bipolar and volumetric cores, including prismatic and pyramidal ones for manufacturing blades of unidirectional, bidirectional and centripetal reduction; and also by cores with platforms extending to the entire surface (or part of it) (Marks, Monigal, 1995; Monigal, 2001).

R. Shimelmitz and S.L. Kuhn, when analyzing finds from Tabun D, have identified yet another important characteristic in the systematic exploitation of cores. Blades, Levallois flakes and points were produced in a single reduction-sequence using different areas of the Levallois core surface, with simultaneous use of unidirectional technique involving core-reduction (Shimelmitz, Kuhn, 2013). This technological tradition can be clearly traced at the earlier stage of the Amudian industry identified in Qesem Cave (Shimelmitz, Barkai, Gopher, 2011).

Such a variety of technological systems of core-shaping to produce various blanks was observed in the Levantine Acheulean assemblages (Goren-Inbar, Belfer-Cohen, 1998). These researchers assumed that each morphological type reflected a specific core-reduction strategy.

The Early Middle Paleolithic artifacts from Tabun D also reflect the use of several technological systems for the manufacture of stone tools (Meignen, 2000). Populations with different techno-typological industry are thought not to have entered the Levant in the Early Pleistocene, nor in the first half of the Middle Pleistocene; therefore, the subsequent development of the Middle Paleolithic industry of Tabun C and B type was based on the already-formed Early Middle Paleolithic industry. It should be recognized that the conclusion drawn by Meignen was correct, implying that technology for producing laminar blades, typical of the Upper Paleolithic, was based on the Mousterian (Middle Paleolithic – **A.D.**) technical knowledge, which developed 150–200 ka BP, long before the appearance of morphologically modern humans (Ibid.: 166).

Evidence shows that from the very early stage of the Middle Paleolithic, blade-blanks predominated in assemblages at some localities. Thus, in Tabun D, the index of blades among intact blanks is 50.1. The blade index in the Early Levantine Middle Paleolithic is about 20, although flakes detached from cores and points were also often used as blanks for manufacturing stone tools (Monigal, 2001). This appears to have predetermined the diversity of primary reduction strategies for production of blanks. Elongated blanks found in the lower units of Hayonim Cave (215–180 ka BP), at the site of Rosh Ein Mor (210 ka BP), and also in the Lower and Middle Paleolithic layers of Misliya Cave (250–160 ka BP) resulted from flaking of Upper Paleolithic-like cores, which coexisted with Levallois cores used for the removal of shortened blanks (Fig. 2). Blades and blade-blanks were often used for different working operations involving no additional retouch. Implements showing traces of secondary reduction are dominated by scrapers,

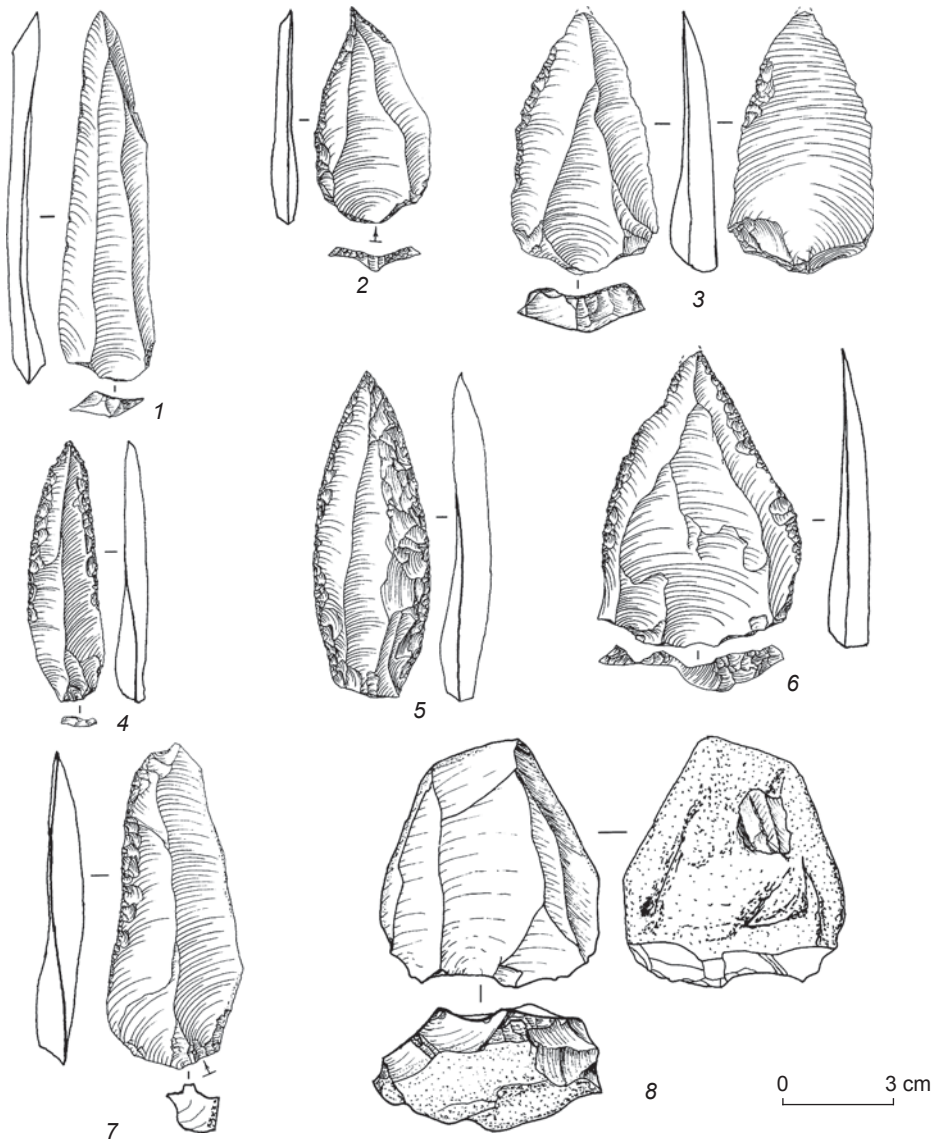

Fig. 1. Artifacts from Tabun IX (Shimelmitz, Barkai, Gopher, 2015).
1 – Levallois point; *2*, *3*, *6* – retouched Levallois points; *4*, *5* – retouched blades; *7* – naturally backed scraper; *8* – Levallois core.

elongated points, borers, truncated tools, backed knives, and other pieces.

In general, the Lower and Middle Paleolithic industry of Tabun D may be characterized by unidirectional convergent (sub-triangular in plan) cores used for the detachment of blade-blanks and elongated points. Blades of regular forms were also obtained from non-Levallois cores. Flakes and shorter broad-based points were removed from bipolar cores. This lithic industry demonstrates the use of various Levallois techniques of reduction and detachment of flakes from oval-shaped radially prepared cores. It reflects not only the dominating Levallois technology, but also other reduction strategies. The Early Middle Paleolithic industries existed for 90–100 thousand years. It is characteristic of this long period that Levallois and non-Levallois techniques, as well as use of blades and flakes as blanks, showed different utilization ratios, which was apparently due to changes in adaptation strategies. In terms of the major techno-typological characteristics, the Early Levantine Middle Paleolithic industry was close to the Upper Paleolithic industry. The similarity is manifested in primary reduction techniques and in the presence of end-scrapers, burins, borers, and some other implements.

Notably, materials dating to the Early African Middle Stone Age, MSA I, which are fundamentally different from the contemporaneous Levantine collections, also include a sizeable quantity of Upper Paleolithic

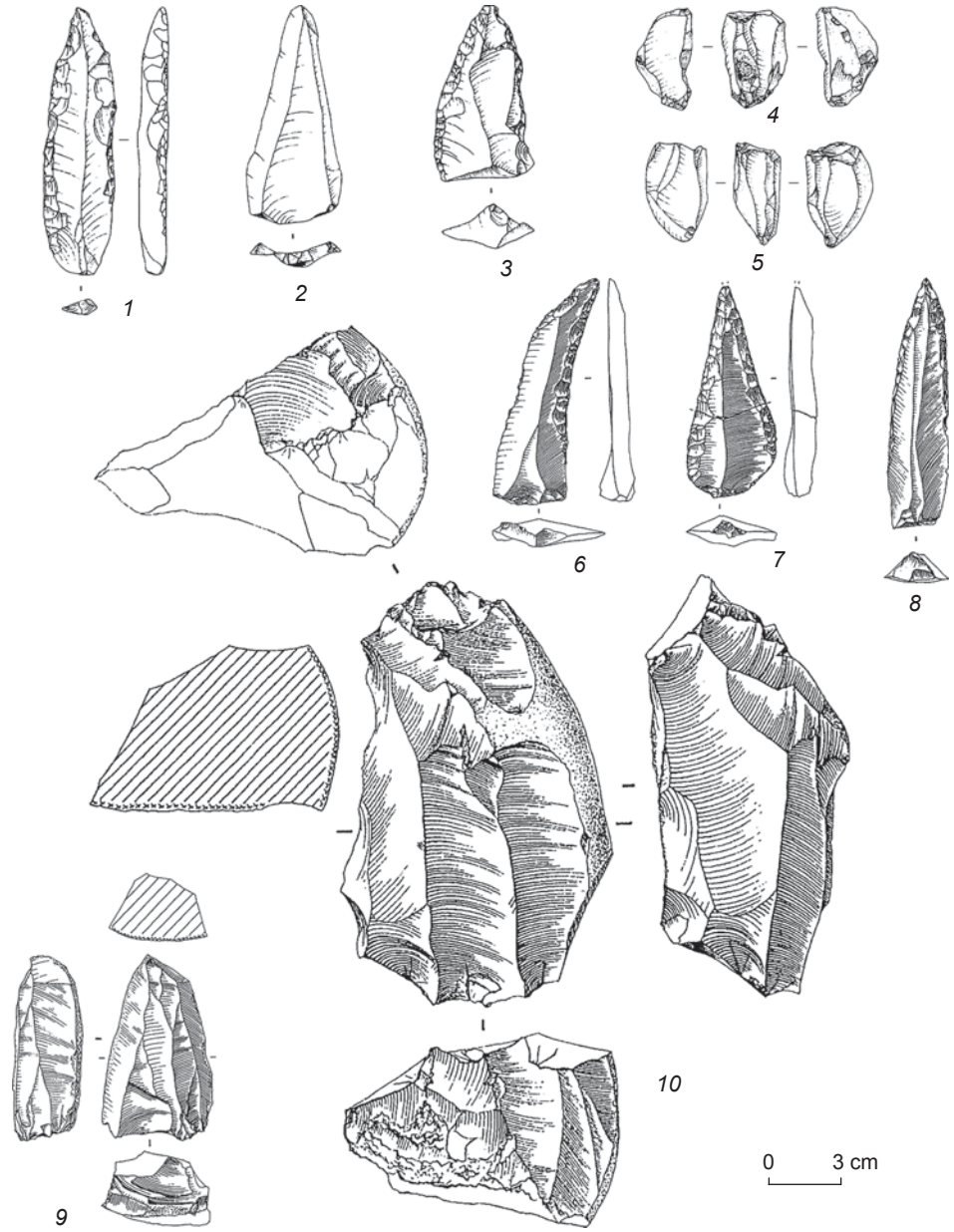

Fig. 2. Artifacts from the caves of Misliya (*1–5*) (Weinstein-Evron et al., 2015) and Hayonim (*6–10*) (Meignen, 2000).
1, *6–8* – Abu Sif points; *2* – Levallois point; *3* – side-scraper; *4*, *5*, *9*, *10* – cores.

artifacts, and represent the primary reduction strategies, which disappear at the subsequent MSA II stage. A similar tendency can be traced in the later Middle Paleolithic industry, Tabun C, which should be dated to approximately 165 (150)–100 (90) ka BP. During the Levantine Middle Paleolithic, Tabun C-type industry became significantly less laminar (Fig. 3). Cores for producing unidirectional removals of blades and Levallois points almost disappeared. Levallois points and Upper Paleolithic tools were found to be scarce. The primary reduction strategy was dominated by such a technique as the removal of classic oval-shaped Levallois flakes from radially prepared cores. Radial and bipolar reduction was characteristic of this lithic industry. The toolkit is dominated by scrapers, notched-denticulate tools, Mousterian-like points, and backed knives; there are burins and other pieces made on flakes. Scrapers include very few tools with straight edges, showing the prevalence of simple convex, double, and convergent pieces (The Stone Age…, 1937; Garrod, 1962; Marks, 1983, 1992; Jelinek, 1982a, b; and others).

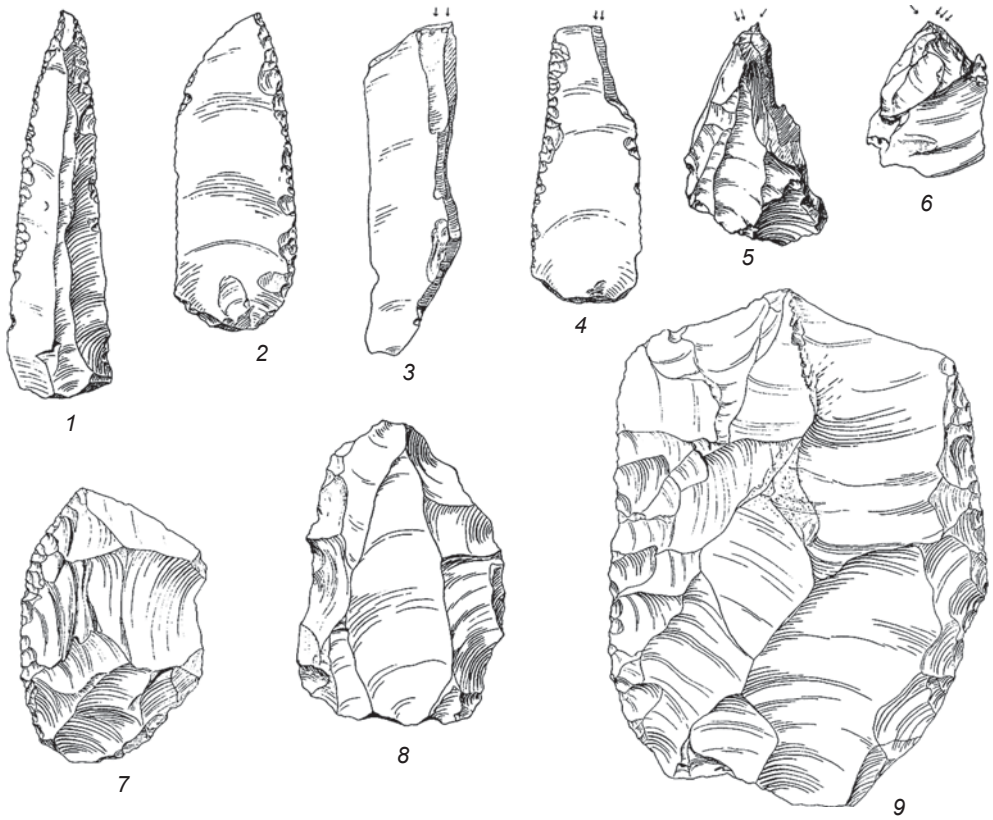

Fig. 3. Artifacts from Tabun C (The Stone Age…, 1937).
1 – point; *2* – scraper; *3–6* – burins; *7*, *9* – scrapers; *8* – core.

According to A. Marks, the differences between Tabun D and Tabun C industries resulted from the use of different reduction-strategies: in the first case, points and blades were removed from the single-platform Levallois cores triangular in plan; and in the second, blanks were detached using the radial flaking technique. Some differences in the toolkit were due to retouching blanks of various types. Changes in the reduction strategy could be associated with a specific adaptation (Marks, 1992).

Chronologically, evidence derived from Skhul and Qafzeh caves, which yielded burials of modern humans, dates to the Middle Paleolithic of Tabun C-type. Skhul Cave is a hollow under a relatively small shelter. The cave is 6 m deep and 14 m wide at the entrance facing northwest (The Stone Age…, 1937). The thickness of loose sediments in the cave is about 3 m; although breccia, which became attached to the cave walls and is situated above the level of modern-day deposits, containing the Middle Paleolithic material, suggests that the upper part of the sediments including occupation layers did not survive.

The remaining part of occupation Layer A is 20–25 cm thick. The layer covers thick strata of cave deposits (Layer B_1). Along the walls and at the entrance area, these strata overlay a series of breccia-like interlayers alternating with stalagmitic lenses in areas adjacent to the walls (Layer B_2). In some sections without breccia, it was almost impossible to distinguish between layers B_1 and B_2. The deposit of grey sand containing rounded material was recognized at the bedrock of the cave. The sinkhole of the grotto revealed a dark brown sand layer (Layer C).

Excavations at Skhul Cave, which has been completely unearthed, yielded more than 10,000 artifacts made of flint, comprising a single assemblage. Finds derived from Layer B_1 were patinated, whereas artifacts from Layer B_2 did not reveal traces of patina and looked "fresh" (Fig. 4). Broad Levallois flakes removed from radial cores, single side-scrapers made on flakes, reutilized square Levallois blade cores, Levallois triangular broad-based points with faceted striking platform, and burins are characteristic of the Skhul lithic industry. It is important to emphasize that Levallois points from the lower layer were found to be far more numerous than those from the upper one, and the percentage of untreated broad Levallois flakes from Layer B_1 was higher than that in Layer C.

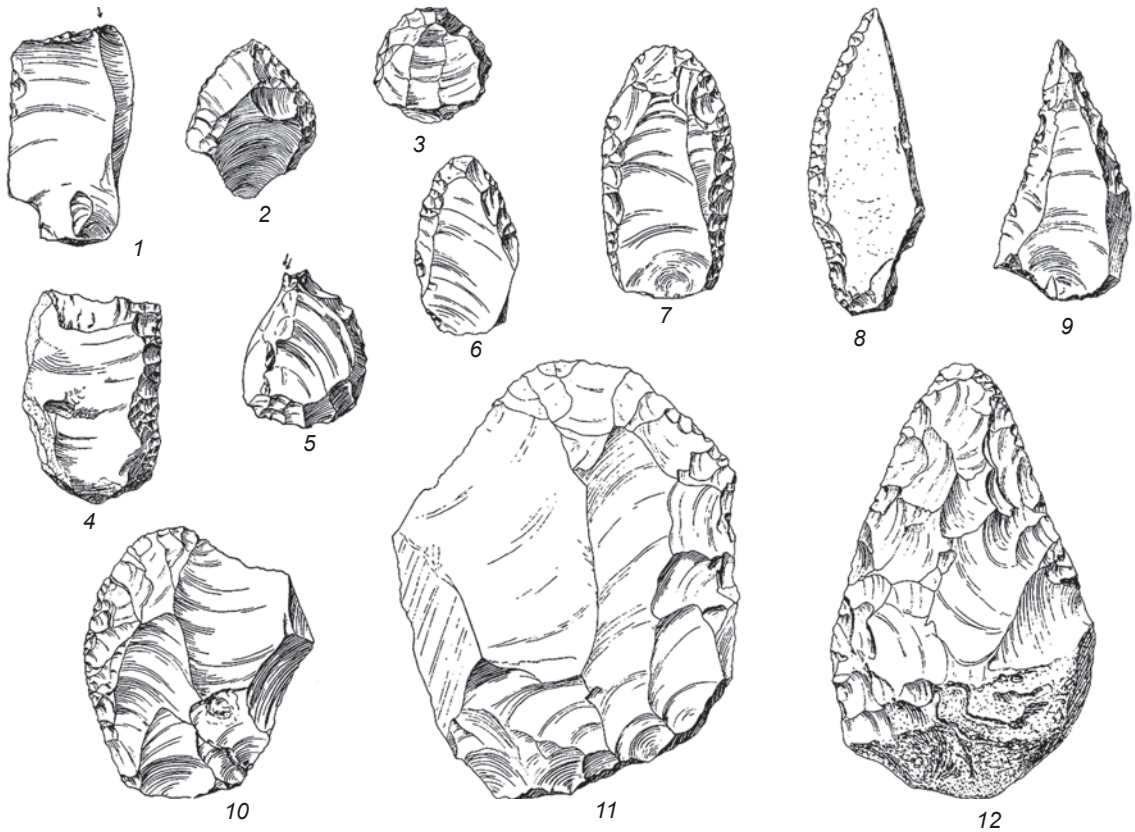

Fig. 4. Artifacts from Skhul Cave, layers B_2 (*1–7*, *10*, *12*) and B_1 (*8*, *9*, *11*) (McCown, 1934).
1, *5* – burins; *2*, *9* – retouched points; *3, 11* – cores; *4*, *6*, *7, 10* – scrapers; *8* – backed knife; *12* – biface.

Age estimates for occupation layers in Skhul Cave fall within a long time span. The first determinations were obtained at the initiative of Ch. Stringer from two bovid teeth using the ESR-method: EU-dates range from 54.6 to 101 ka BP, averaging 81 ± 15 ka BP, LU-dates range from 77.2 to 119 ka BP, averaging 101 ± 12 ka BP (Stringer et al., 1989). The following TL-dates were obtained from six samples of burnt flint: 166.8–99.0 ka BP, averaging 119 ± 18 ka BP (Mercier et al., 1993). F. McDermott has determined ages for two samples selected by Stringer, as well as for three samples from Layer B, using ESR-method, and revealed significant differences (McDermott et al., 1993).

According to McDermott, chronologically different human groups were probably represented in Skhul Cave (Ibid.), which confirms conclusions drawn by the first investigators of the cave, T. McCown and A. Keith (1939). A. Ronen also believed that burials in 2 m thick strata at Skhul Cave could have been separated by a significant time span (1976).

The age determinations obtained by McDermott make it possible to recognize an earlier group of hominins, dating back to 110–90 ka BP, and a later one, dating to 60–40 ka BP. More recently, Ronen, on the basis of the results of direct dating by ESR and U-series (Grün et al., 2005), came to a conclusion that the remains of modern humans should be dated to 102 ± 26 ka BP (2012).

Among localities in the Near East and in Eurasia generally, Skhul Cave undoubtedly holds a special place, owing to the discovery of modern human burials associated with the site. Human remains attributed to 10 individuals, which have been found in the cave, constantly come to the attention of anthropologists. We support the view of D. Johanson that this anthropological material provides insights into processes of sapienization worldwide (Johanson, Blake, 1996), and consider that DNA sequencing of both the remains from Skhul and Qafzeh caves and those of the Palestinian Neanderthals needs to be done as soon as possible.

In Israel, Qafzeh Cave has also yielded remains attributed to anatomically modern humans (Neuville, 1951; Vandermeersch, 1981; Korobkov, 1978). The cave is located 2.5 km southeast of Nazareth, facing southwest. It is 20 m wide and 12 m deep. In addition to the chamber with a high roof, which adjoins the entrance restricted from two sides by rock walls and separated

from the grotto by a threshold about 1.5 m high, the interior includes the so-called "vestibule", where the paleoanthropological remains were found. Excavations were conducted in 1930–1936 by R. Neuville and M. Stekelis and in 1965–1980 by B. Vandermeersch in the outer part of the "vestibule". The researchers marked the layers differently; thus Neuville designated them from M to A from the bottom upwards, and Vandermeersch from XXIV to I.

According to Neuville, the Middle Paleolithic layers are those from M to F; and according to Vandermeersch, those from XXIV to XI. Neuville describes the Middle Paleolithic industry of Qafzeh as Levalloisian, showing an abundance of Levallois points. They include few elongated pieces. Most Levallois points are broad-based, with faceted striking platforms. These points reveal no retouch, or were produced mainly with a single-row retouch on one edge. Scrapers were manufactured from flakes removed from radial cores, and constituted 15–20 % of all pieces. Notched-denticulate tools were recorded in considerable numbers; notches, burins, and backed knives were recovered as well. Some occupation layers contained preserved hearth features. Neuville unified the whole industry from Qafzeh into a single techno-typological complex, and considered that it appeared to have been developed locally.

In 1930, during the excavations, Neuville and Stekelis recovered human remains belonging to 7 individuals, and in 1934 they managed to find numerous fragments of human skeletons: in particular, four craniums. Vandermeersch excavated skeletons of another 14 individuals. One of those finds known as Qafzeh IX, a skeleton of a female of the age of about 20, who was buried with her legs bent, was found to be the most complete and showed a good state of preservation. Only several centimeters away from Qafzeh IX, there was a child's skeleton (Qafzeh X) buried in a very flexed position (Zubov, 2004). These individuals shared one burial pit.

The average date for all layers in Qafzeh is 92 ± 5 ka BP (Kaufman, 2002). The ESR-dates for modern human remains obtained from teeth are as follows: 100 ± 10 and 120 ± 8 ka BP (Grün, Stringer, 1991).

The Tabun C Middle Paleolithic industry is generally characterized by the prevalence of radial core-reduction, according to E. Boëda (1988). Flakes of various sizes, removed from such cores, were used as blanks for many implements—scrapers of various modifications, notched-denticulate tools, and others. Archaeological evidence includes triangular broad-based Levallois points with faceted striking platforms in the form of *chapeau de gendarme*. These pieces were often left unretouched, or in the opposite case, there was primarily a single-row retouch made on one edge.

Characteristic of the final Middle Paleolithic industry of Tabun B is the predominance of single-platform unidirectional Levallois cores (aimed at detachment of short broad-based points, which are also represented in the lower deposit), blades, and radial cores for flakes removal. The toolkit is dominated by side-scrapers and their other modifications, backed knives, and notched-denticulate tools (Fig. 5). L. Copeland considered the final Middle Paleolithic in the Levant the latest combination of lithic industries of Tabun D and Tabun C types (1975).

In the Levant, the multi-stratified sites of Raqefet, Kebara, Amud, Emireh, Ksar Akil, Boker Tachtit and others, with cultural layers dating back to the final Middle Paleolithic overlaid by the Upper Paleolithic deposits, were subjected to archaeological investigation. Field research in Kebara Cave, located on Mount Carmel, was carried out in the 1930s by D. Garrod and T. McCown, who identified the Early Natufian, Late Upper Paleolithic, and Middle Paleolithic layers. Renewed excavations have made it possible to specify the stratigraphy and recognize four Upper Paleolithic layers overlying the final Middle Paleolithic deposits (Bar-Yosef et al., 1992; Sarel, Ronen, 2003; Meignen, Bar-Yosef, 2005).

Among the finds from Kebara Cave, flakes resulting from recurrent Levallois core reduction, dating to the Late Middle Paleolithic, predominated. Blanks were removed by unidirectional convergent knapping from cores with convex flaking surfaces. Lithic analysis of finds from all layers suggests that the primary removal of blanks was almost the same. Blades recovered from the lower layers XII and XI constituted 30 % of Levallois blanks. In the upper layers X and IX, broad-based Levallois points were found more frequently. Materials from layers VIII–VI provide evidence that the tendency to produce pieces of sub-triangular forms, along with the sub-rectangular ones, was maintained. Lithic assemblages from each occupation layer included retouched tools constituting about 3–4 %.

L. Meignen and O. Bar-Yosef conducted a comparative analysis of the Middle Paleolithic industry from Kebara and technocomplexes of some other sites in the Levant (1992). According to these researchers, the main characteristic features of the lithic industry from the cave were flakes and short broad-based points corresponding to the Tabun B industry. The Kebara industry was also found to be close to the finds from layer XXVIII in Ksar Akil, Amud, and especially from layer B in Sefunim Cave.

TL and ESR age estimates for the Middle Paleolithic layers in Kebara provided dates that lie in the range of 48–66 ka BP (Porat et al., 1994) (Table 2).

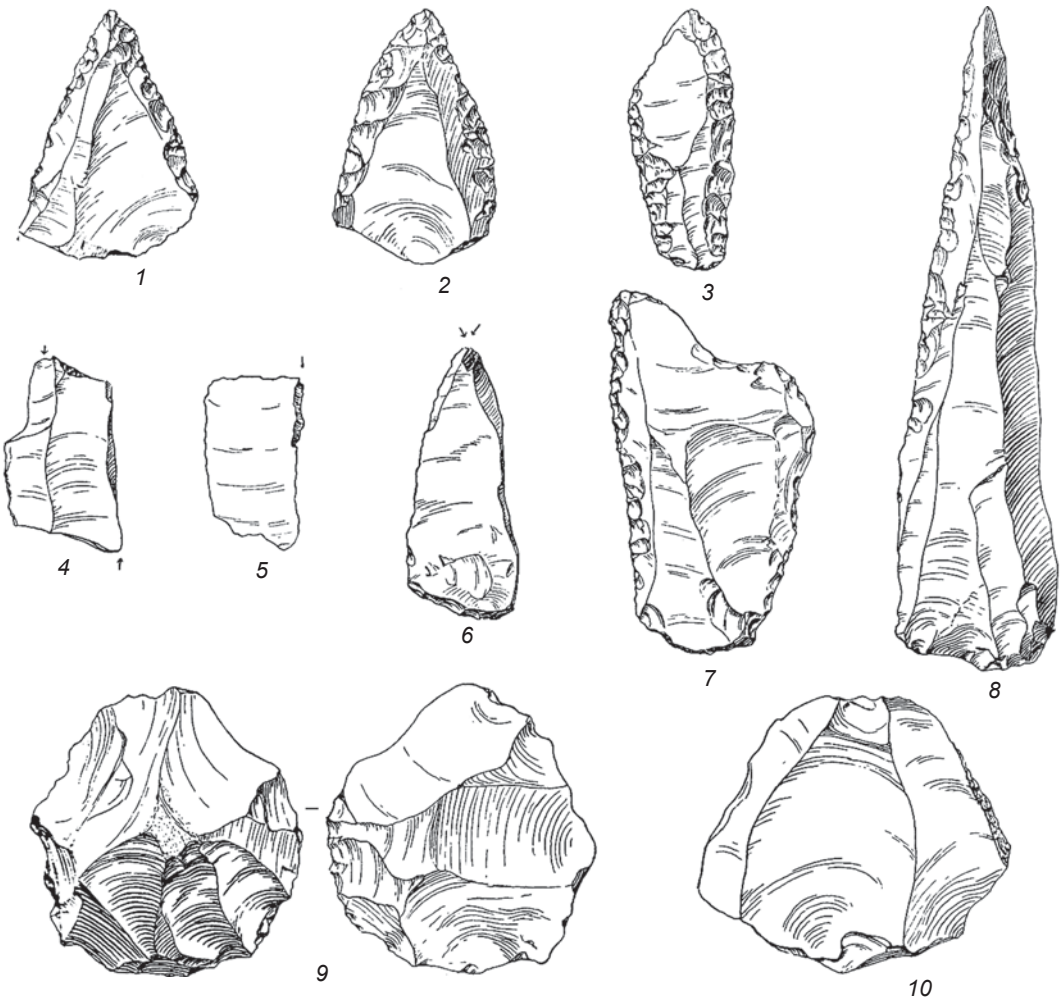

Fig. 5. Artifacts from Tabun B (McCown, 1934).
1–3 – retouched points on triangle-shaped flakes; *4–6* – burins; *7* – scraper; *8* – Abu Sif point; *9*, *10* – cores.

Table 2. **Dates for Kebara Cave, ka BP***

Layer	TL-method	ESR-method	Other methods
	Charred flint		Dental enamel
VI	48.3 ± 3.5	53.9 ± 4.6	–
VII	51.9 ± 3.4	66.7 ± 6.0	–
VIII	57.3 ± 4.0	58.2 ± 5.4	–
IX	58.4 ± 4.0	–	–
X	61.6 ± 3.6	–	60 ± 6.0 (EU) 64 ± 6.0 (LU)
XI	60.0 ± 3.5	65.1 ± 5.1	–
XII	59.5 ± 3.5	58.9 ± 5.5	–

*After: (Porat et al., 1994).

Excavations at Kebara Cave have yielded fragments of a child's skeleton (Kebara I), and also a rather well-preserved postcranial skeleton of a male individual at the age of 25–35 (Arensburg et al., 1985; Vandermeersch, 1969, 1981). The man was buried in a shallow pit in a supine position. His height was about 170 cm. Anthropologists have identified a hyoid bone among the individual's remains (*os hyoideum*), showing almost no anatomical difference from that of modern humans, indicating the capacity for speech. Morphologically, the hominin revealed similarity to individuals from Skhul Cave, although he was more massive. The anthropological finds recovered from the occupation layer were associated with numerous stone tools, dating back to the final Middle Paleolithic of Tabun B-type.

Anthropological finds, morphologically close to Kebara I, were discovered in a small cave of Amud (Watanabe, 1968; Rak, Kimbel, Hovers, 1994; Ohnuma, 1992). The lithic industry from this locality can be generally characterized by the basic technological and typological features typical of technocomplexes dating to the final Middle Paleolithic of Tabun B-type. The assemblage is dominated mainly by cores of two types: sub-triangular in plan, unilateral for removal of short points with faceted striking platform (*chapeau de gendarme*); and radial, for detachment of flakes. A small number of cores can be attributed to non-Levallois cores for blade production. Blanks include about 55 blade-like flakes, 750 sub-triangular and triangular spalls, and about 200 blades with parallel edges and with a length of twice the width.

Among retouched tools, it is possible to distinguish points with fine retouch applied primarily from a dorsal side, end- and side-scrapers on blades and laminar spalls, scrapers on flakes (mainly double and convergent), and also flakes and blades with fine retouch on the edge.

The following Upper Paleolithic artifacts are noteworthy from among the stone tools: chamfered pieces (*pièces à chanfrein*), borers, borer-like pieces, and end-scrapers. Some points reveal bases with fine retouch; they show resemblance to similar tools from Emireh. K. Ohnuma, having compared the lithic industry from the Upper Paleolithic layers B_4 and B_2 in Amud, came to a conclusion that the implements derived from both layers, in spite of few differences, demonstrate significant similarities and can be attributed to the Levantine Mousterian of Tabun B-type (1992: 103).

Of specific interest is the burial of a young male (Amud I). This individual can be distinguished among all Neanderthals for his height (over 180 cm) and cranial capacity (according to some sources, 1740 cm^3, according to others, 1800 cm^3). Along with the typical Neanderthal features (pronounced supraorbital torus, retreating forehead, a low skull vault, and others), this individual demonstrated traits distinguishing him from the European "classic Neanderthals": a higher skull vault; rounded occiput without a chignon; smaller teeth; mental protuberance, beginning to take shape; robust mastoid processes of temporal bone, and others. Many anthropologists associate Amud I with the Palestinian Neanderthals, who were close to representatives of the Skhul-Qafzeh group.

Another site with anthropological finds was studied in Dederiyeh Cave, Syria, 60 km northwest of Aleppo (Akazawa et al., 1993, 1995a, b; 1999). This is a large cavity (about 15 m wide at the entrance, 60 m deep, with a maximum width of 40 m), with a vaulted dome over 10 m high. The cave is located at the height of 450 m asl on the left bank of Wadi Dederiyeh. Excavations were conducted at the entrance, yielding the Natufian stone tools; and inside the cave, where the final Middle Paleolithic industry and two burials were found. One of the burials contained a well-preserved child's skeleton. The total number of buried individuals found during the excavations included no less than four children and six adult and young people. Data resulting from the excavations at Dederiyeh Cave have not been widely published in the Russian scientific literature, compared to materials on the study of the Middle Paleolithic in Israel; therefore, they will be discussed here in more detail.

The main excavation area at the back of the cave, where the Neanderthal burials and the final Middle Paleolithic industry were identified, exposed the sequence including 15 geological units. Given the abundance of archaeological evidence, researchers divided the units into several sub-layers. The stratigraphic sequence of cave deposits is generally clearly seen: the interfaces between the layers are distinguishable, except for areas adjacent to the walls. All 15 units were integrated into four strata from bottom to top: the fourth one, layers 15–12; the third, layers 11–7; the second, layers 6–4; and the first, layers 3–1.

The lower stratum yielded a small number of artifacts: two Levallois cores with negative scars from single-sided removal of points, one radial core for flake-removal, convergent and double scrapers on flakes and blades, and retouched laminar spalls. Thus, the lower layers included scarce artifacts associated with the lithic industry typical of the final Middle Paleolithic of Tabun B-type. Layer 13 revealed the crown of a first maxillary molar.

The overlying layers of the third stratum contained a greater quantity of stone tools, which corresponded completely to the finds from the lower deposits. The lithic assemblage included cores of Levallois types

for removal of short broad-based Levallois points with faceted striking platforms, as well as radial cores for detachment of flakes. Debitage was dominated by Levallois flakes. Points, blades, and retouched flakes constituted a high percentage. There were backed knives, notched-denticulate tools, retouched broad-based points, single- and double side-scrapers (each with a straight and a convex edge) made on flakes and blades, end-scrapers on blades, and retouched blades and flakes. Layer 11 yielded the burial of a 2-year-old child. The bones were found lying in anatomical order in a specially dug pit. A flake lay on the bones of a thoracic section. The remains of a hearth were identified near the burial.

The second stratum also revealed lithic artifacts typical of the final Middle Paleolithic. These were mainly cores of Levallois type for production of shortened points and flakes. Materials from this stratum and underlying layers represented the single technique of core-trimming and use of flakes and blades. Retouched blades, points, and flakes contributed significantly to the assemblage. Excavations yielded double single and convergent side-scrapers with straight and convex edges made on flakes and blades; cortically backed knives; end-scrapers and burins; and retouched flakes and blades. Layer 6 revealed several combustion features in association with bones of wild animals. A number of hominin remains were recovered from layers 5 and 4.

In the abundance of finds in the uppermost strata, layer 3 can be distinguished. Stone implements were found in several sub-layers, and their techno-typological characteristics showed no differences from those of the tools recovered from the underlying layers. Layer 3 also contained hearths, with fragments of animal bones and charred plant remains scattered nearby. This layer yielded the partial skeleton, with a facial skull showing a good state of preservation.

All the stone implements of the final Middle Paleolithic that were found in Dederiyeh constituted a single assemblage, typical of Tabun B as regards their techno-typological characteristics. Cores were dominated by Levallois forms for the detachment of shortened points and radial flakes. Points, flakes, and blades were subjected to retouch. Scrapers predominated in the tool assemblage. According to the type of working edge, they can be classified into two major groups: straight, and convex or concave. The edges were intensely retouched. The percentage of scrapers grew from the bottom to the top. All layers contained Upper Paleolithic stone tools. Among typical finds were burins and end-scrapers. Their number also increased from the bottom up.

Radiocarbon analysis carried out on six samples shows that the site of Dederiyeh Cave can be dated to the period between 48,100 ± 1200 ka BP and 53,600 ± 1800 ka BP. Researchers note that the latter date reaches the limit of the radiocarbon dating method, and do not exclude a greater age of the lower layers. Humic acids showed the period from 48 to 55 ka BP.

During the excavations in the cave, faunal remains of different species were also found. The lower stratum contained the bones of wild goat and mouflon. The predominance of bones attributed to these species was recorded in the third stratum, and the number of remains of steppe inhabitants (such as gazelle, rhinoceros, horse, and also temperate zone animals including red deer, wild boar, and buffalo) showed the increase as compared to the underlying layers. The bone-remains of animals representing temperate-zone species were found to predominate in the upper layers; the bones of red deer constituted about 30 % of all the faunal remains. A comparative analysis of the faunal remains revealed significant differences between the animals whose remains were represented in the fourth and the first strata. The explanation provided by researchers is that the deposition of the upper layers occurred in more humid conditions, and the area near Dederiyeh Cave was covered with forests. This may have resulted in the increase of scrapers in the upper occupation layers.

A well-known Shanidar Cave in Iraq, which also yielded Neanderthal remains, was studied by R. Solecki during four seasons (1953, 1960, 1975; and others). The site is located in a gorge bisecting the slopes of the Bradost mountain range, at an elevation of about 360 m above the level of the Great Zab River. The entrance to the cave, facing south, is 25 m wide and 8 m high; the cave is 40 m long and has a maximum width of 53 m. The loose sediments in the cave, 14 m thick, included four occupation layers. Three layers (A, B, C) are attributed to the Neolithic–Upper Paleolithic. Layer D, with a thickness of more than 8 m, is dated back to the final Middle Paleolithic. Its exposure showed that there were five collapses of the ceiling, indicating earthquakes. Anthropological evidence attributed to *H. neanderthalensis* was found under a heap of stones.

Stone artifacts recovered from the very bottom of the cave suggest that the hominin occupation of the cave started at the beginning of the process of filling the cavity with loose sediment. A small amount of heavily exhausted cores and debitage may provide insight into the primary reduction. Exhausted radial cores are evident among nucleuses. In addition to flakes, small broad-based elongated points, as well as blades, were identified. It is obvious that not only radial, but also Levallois cores were used for detachment of points and blades, as well as non-Levallois forms to produce blade-

blanks. Lithic assemblage was dominated by single scrapers with straight, convex and curved edges, as well as by convergent scrapers made on blades and laminar flakes. There were many flake- and blade-tools with abrupt retouch. Solecki found four small-sized points with thinning of the ventral base, which he attributed to the Emireh-type. Unfortunately, data about stone implements from Shanidar Cave were published only partially. In general, they demonstrate similarity to Late Middle Paleolithic artifacts from both the Levant and the rest of Southwest Asia.

No reliable age determinations have been established for the Middle Paleolithic industry of Shanidar. Solecki suggested that the occupation of the cave started in the Early Würm stadial, about 100–80 ka BP. The top of Layer D produced a radiocarbon date of 46,900 ± ± 1500 ka BP (Bar-Yosef, 1998).

Morphologically, the Shanidar Neanderthals are somewhat different from those of Europe and Palestine, the latter being represented by Amud, Kebara, and Tabun. The total number of Shanidar individuals is nine, including seven adults and two children; the number of crania is five. The most informative find is Shanidar I, represented by both cranium and postcrania. The cranium shows a number of Neanderthal features, such as a strong and continuous supraorbital torus, a pronounced occipital bun ("chignon"), low forehead, midfacial prognathism, and absence of chin or canine fossae, etc. A.A. Zubov subscribes to the view of those who find certain similarities between Shanidar and the Western European "classic Neanderthals", opposing them to Skhul and Qafzeh humans. The Shanidar individuals, however, display certain progressive characteristics, suggesting their deviation from Western European Neanderthals toward anatomically modern humans. Zubov disagrees with the view that Shanidar humans resemble "classic Neanderthals" of Western Europe in all respects (2004: 299).

E. Trinkaus' view of Shanidar Neanderthals deserves attention (1983). In his words, the group is relatively homogeneous despite certain individual variations and what might be seen as two morphological variants. Several features of these humans attest to evolutionary stasis. Only the facial skeleton displays certain changes over time: it is more flattened and archaic in earlier group members, and shows some midfacial prognathism in later ones.

A detailed analysis of the various trait-systems in Shanidar Neanderthals and other Near Eastern humans of the Late Pleistocene has revealed evolutionary changes occurring in that territory and in Europe in parallel. They concern both cranial and postcranial features and general robustness. Near Eastern Neanderthals show some changes in the proportions of teeth, and considerable variation in their size. Dental variability, skeletal robustness, and cranial archaism in certain Near Eastern Neanderthals oppose them to contemporaneous anatomically modern humans. The facial skeleton, however, sets them apart from robust Middle Pleistocene hominins, evidencing a tendency toward less robustness and anatomical modernity. While being more archaic than the anatomically modern humans in terms of postcranial skeleton and anterior teeth, the Shanidar humans show facial reduction that is highly relevant to interpreting the evolutionary changes, some of which may have been caused by cultural innovations.

The Shanidar hominins are of interest to scientists from yet another point of view: the body of the Shanidar I individual, who died in a rock-fall due to an earthquake, as suggested Solecki, was covered by his tribesmen with large limestone blocks and smaller rocks. According to anthropologists, this individual had lost his arm while alive. A one-armed man could not have survived at that time without support and help from the other members of his group. The burial of Shanidar IV provides insight into social relationships within the population. After burying the dead in a special hollow, his tribesmen covered the grave with flowers and medicinal herbs (Solecki, 1975; Lietava, 1992). The final Middle Paleolithic in the Levant is associated with the Palestinian Neanderthals, who showed significant morphological differences from the Western European "classic Neanderthals". The lithic industry of Tabun B-type, according to Meignen and Bar-Yosef, also differs substantially from the European Mousterian industries (2002).

Since the techno-typological characteristics of the Levantine Mousterian have been described in many publications, we will focus only on several Middle Paleolithic localities in the Levant, and will not discuss such important sites as Nahr Ibrahim Cave, the final Middle Paleolithic complexes of Ksar Akil, Boker Tachtit, and others. All the Middle Paleolithic localities in the Levant, according to the three stages (phases) Tabun D, C, and B, are different in terms of stone tools, but comprise a single techno-technological complex that had evolved for more than 200,000 years. The complex was changing under the environmental conditions and during contacts with populations from the adjacent areas. However, in general, from our point of view, the development of the Levantine Middle Paleolithic industry was mainly autochthonous, and was associated with modern human populations and the Palestinian Neanderthals.

The issue of how the development of the Middle and Upper Paleolithic in the Levant occurred, successively or discontinuously, has remained the subject of debate for over 80 years. Its resolution is hampered by the fact

that the sequence of cultural horizons at multilayered Paleolithic sites cannot always be fully recognized, despite the improvement of geochronological methods; and the correlation of data resulting from techno-typological and comparative analysis of evidence from the Levant is sometimes impeded; researchers focus their attention on technological analysis to the detriment of typological examination, compare materials obtained during the field archaeological studies, regardless of the degree to which the finds have been studied (this particularly affects the results when the percentage of various tool-types is compared); research materials from the same site are kept different storage places (for example, the site of Ksar Akil), etc.

There are two key points of view on the provenance of the Levantine Middle Paleolithic. A hypothesis about the peculiarity of the Levantine Middle Paleolithic (Acheulo-Mousterian) and its difference from the Western European was seemingly first suggested by Garrod (The Stone Age…, 1937). We think that Bar-Yosef has fairly concluded that the Middle Paleolithic assemblages of the Levant represent a special unity within the context of the African and Asian Middle Paleolithic industry (2006). The important role of the technology of blade production using Levallois and non-Levallois reduction strategies is one of the main features distinguishing the Lower and Middle Paleolithic Levantine industries from the African industries of the same periods.

During the African Stone Age, the Levallois flaking system was the most commonly used technology; however, as H. Crew showed (1975), it differed from the Levallois reduction strategy used in the Levant. Levallois (proto-Levallois) primary reduction technique initially appeared at Gesher Benot Ya'aqov during MIS 18–20 (Goren-Inbar, 2011: Ill. 8, *1*). With regard to continuity in the Levantine Paleolithic, it is necessary first of all to refer to a unique sequence of occupation layers in Tabun Cave. The lowermost occupation layer G yielded notched-denticulate tools with abrupt retouch, single side-scrapers, isolated amorphous burins, chopper-like pieces, and other stone tools. Cores are represented by shortened pyramidal, single-sided shapes for detachment of amorphous blades and blade-flakes, and also by those showing traces of irregular reduction. The overlying layer F showed high frequencies of burins and end-scrapers. Four Levallois cores have been distinguished among those with single- and double-platform.

Materials of the lower layers G and F in Tabun Cave suggest that Levallois and laminar knapping was used for primary reduction; but as a whole, the technology of producing blanks for toolkit manufacture was aimed at detachment of flakes from cores. A. Jelinek pointed to a minimal role of the Levallois technique in a technological characteristic of the lithic industry from the two underlying horizons (1975). However, owing to the presence of Upper Paleolithic tools (burins, end-scrapers), this industry may be interpreted as considerably advanced.

Materials from the overlying layer E included three facies or three industrial complexes: 1) Yabrudian, mainly aimed at producing flakes and manufacturing Quina-type scrapers; 2) Acheulean, related to predominant manufacture of bifaces, scrapers, and flakes; and 3) Amudian, intended for production of Upper Paleolithic blades and tools (Copeland, 2000). In the early 1980s, Jelinek, on the basis of his excavations, came to the conclusion that all alternating facies of the layer E industry, including the Amudian, pertained to the same Mugharan industrial tradition. He explained the presence of various facies by adaptation of ancient populations to various environmental environments (Jelinek, 1981, 1982a, b). In his opinion, the Amudian tradition developed gradually on the basis of preceding local cultural traditions, while the Levalloiso-Mousterian industry was derived from the Mugharan tradition.

In our opinion, the materials of the Acheulean localities in the Levant allow the conclusion that blade and Levallois technology played not a leading, but an important role in production of blanks for the manufacture of tools in the industry of ancient Levantine populations. During the Acheulo-Yabrudian stage of the final Acheulean, the significance of blade technologies considerably increased. This resulted, already in the Upper Paleolithic, in the appearance of cores prepared for the subsequent production of blanks. Among these cores, four typological groups should be distinguished: unifacial, radial, Kombewa, and Levallois for production of flakes. Properly speaking, they were rather close in terms of production technique, from the stage of primary shaping of blanks to the detachment of flakes from them. Therefore, the questions of where one or another type of cores first appeared, or how and when it spread to other regions of Eurasia, can be discussed endlessly (Derevianko, 2016a, b). When comparing the final Acheulean industry of the Levant and those of Africa and Europe, Bar-Yosef notes that the Acheulo-Yabrudian assemblage can be regarded as a local complex, geographically restricted in its distribution to one region (1994: 257). In the Amudian industry of the Late Acheulean, blade-blanks played a significant role in tool manufacture. This is clearly illustrated by the study of Qesem Cave, Israel (Barkai, Gopher, Shimelmitz, 2005; Shimelmitz, Barkai, Gopher, 2011; and others).

The Levantine Middle Paleolithic was developed on the basis of the Amudian industry, which appeared

approximately 400 ka BP (Shimelmitz, Barkai, Gopher, 2011). In our opinion, the evolutionary development of the Middle Paleolithic industries of Tabun D-, B-, C-type seems to have taken place up to the Upper Paleolithic. It is obvious that for 200,000 years, changes in paleoenvironmental conditions, various adaptation strategies, short-term contacts with human populations from the adjacent areas, and other factors introduced some innovations into the Middle Paleolithic technocomplex in the Levant. Moreover, the Upper Paleolithic core-reduction techniques and the Upper Paleolithic tool-types could have appeared as far back as in the Lower Paleolithic, and subsequently disappeared with time; the Levallois flaking system could have also appeared and vanished during such a long period of time.

The opponents of the continuity approach to the development of the Levantine Paleolithic from the Acheulean to the final Middle Paleolithic present different arguments in order to prove their position. Here are some of them. The Middle Paleolithic sites of Tabun D-type are found in arid zones in the interior of the Levant, and the sites of Tabun C-type are located mainly along the coastline; the Tabun C-type Mousterian disappeared with the arrival in the south of the region of Neanderthals, who brought the Tabun B-type Mousterian about 75 ka BP, or yet continued to exist after the appearance of this species until the time when *H. sapiens* migrated into the Levant with the Upper Paleolithic technologies; primary and secondary reduction strategies changed in certain periods during the latter half of the Middle and the earlier half of the Upper Pleistocene. The hypothesis about discontinuity in the development of the final Acheulean and Middle Paleolithic industries is also based on differences in the percentages of blades, flakes, and other types of stone tools.

All researchers, including ourselves, can clearly see a certain mosaic pattern in primary-reduction strategies and the shaping of some tool types; and in the percentage of stone artifacts, revealed throughout the Acheulean and the Middle Paleolithic in the Levant. For example, in the Early Middle Paleolithic of Tabun D-type, there occur pyramidal cores of the Upper Paleolithic type, and Upper Paleolithic stone tools, which can hardly be found at the Middle Paleolithic sites of Tabun C-type; and again they appear in the final Middle Paleolithic of Tabun B-type. From our point of view, some differences in the Levantine Paleolithic industry were due to changes in environmental conditions, which induced humans to develop new adaptation strategies. A similar variability of the Paleolithic industries can be observed in Africa, Europe, Altai, and other regions. According to C.A. Tryon and S. McBrearty, changes in hominin adaptation strategies during the Acheulean to Middle Stone Age transition in Africa were gradual and diverse (Tryon, McBrearty, 2006). The same situation can be observed in the Levant (Goren-Inbar, 2011), but this does not imply that a single line of development was discontinued in the Paleolithic industry.

The study of the processes resulting in the emergence of blade technologies in Africa and Eurasia, as well as specifics of their distribution, show that in the same areas, during the Middle and Late Pleistocene, blade technologies and the Levallois flaking system appeared and disappeared repeatedly; coexisted with flaking techniques; and dominated or played insignificant roles in the production of stone tools. The complexity in the development of lithic industries was not always associated with migration processes. Owing to the arrival of people with a different tool industry in an area with a local population, either diffusion of cultures could have taken place; or the replacement of the indigenous population by immigrants, resulting in replacement of the whole technocomplex. In the Levant, from our point of view, the so-called discontinuity in the Middle Paleolithic industries of Tabun D-, C-, and B-type had nothing to do with the appearance of a different population in the region; it was the result of the evolution of the lithic industry over two hundred thousand years. Archaeologists cannot trace this process in its details.

All researchers of the Levantine Middle Paleolithic believe that 130–100 ka BP, a population of anatomically modern humans migrated into this region from Africa. This is evidenced by anthropological finds from the caves of Skhul and Qafzeh. Further, we shall shortly discuss the development of the lithic industry in South, East and North Africa, whence anatomically modern humans could have migrated into the Levant in a time span from 200 to 80 ka BP.

The earliest occurrence of blade technology in Africa was identified in the Kapthurin Formation, Kenya. The sites of GnJh-42 and GnJh-50 associated with member K[1]3 recognized in the deposits of this formation were studied and dated by $^{40}Ar/^{39}Ar$ method to 545 ± 3 and 509 ± 9 ka BP (Johnson, McBrearty, 2010). Over 95 % of all blanks at both sites were flakes (including fragments and angular spalls); 2.7 % constituted blades and their fragments. At the sites of GnJh-3, -15, -17, the younger lithological layers also revealed a laminar industry showing no technological association with the earlier one (McBrearty, Bishop, Kingston, 1996; McBrearty, 1999; McBrearty, Brooks, 2000; Derevianko, 2015).

In Africa, continuity cannot be traced between the Acheulean localities in the Kapthurin Formation, nor even between these and the Middle Stone Age localities. The latter are perhaps best-studied in the south of the

continent, where a lot of deeply stratified cave sites, rock-shelters, and open-air sites are located. The beginning of the Middle Stone Age (MSA) is identified at the Paleolithic sites by the disappearance of bifacial tools, cleavers, and other pieces typical of the Late Acheulean. Chronologically, the transition boundary is defined differently: from 250 to 200 ka BP. R. Singer and J. Wymer, relying on archaeological evidence from the excavations on the Klasies River, recognized several stages in the development of the Middle Paleolithic industry in southern Africa: MSA I, MSA II, Howiesons Poort, and MSA III (1982).

The laminar flaking system is characteristic of the early MSA I; however, technologically, it is not associated with the lithic industry recovered from the Kapthurin Formation.

The early MSA I, in terms of major techno-typological characteristics, is significantly different from the preceding and the subsequent stages. During MSA I, blades were removed by a soft hammer; and in MSA II their production involved use of a hard hammer, and common use of faceted striking platforms. According to S. Wurz, blanks detached from cores at these two stages showed significant differences. At the earlier stage, as compared to the later, the platform width of blades and points was much smaller, and values of the ratio of the blank's length to platform's length were higher. In MSA III, points were considerably shorter than in MSA II and MSA I (Wurz, 2005: 433). In Blombos Cave, the middle section of the culture-bearing deposits, designated as phase M2, yielded a number of bifacially flaked stone artifacts and over 20 bone tools that appear to have been used as points and awls (Henshilwood et al., 2001). They produced the following TL dates: 76 ± 7, 105 ± 7, and 105 ± 9 ka BP (D'Errico et al., 2005). The overlying cultural layer contained Still Bay artifacts. This layer revealed about 400 bifacially worked points, including those with finely shaped hafts, over 10 bone tools, and a bone-fragment with engraved horizontal lines. They were dated by the TL-method to the period from 67 ± 7 to 82 ± 8 ka BP (Ibid.), and by the OSL-method to 75.2 ± 3.9 ka BP (Jacobs, Wintle, Duller, 2003). Pyramidal cores were found to be typical of both Howiesons Poort and MSA I stage. The Howiesons Poort sites produced smaller blades of geometric form, with blunted, retouched backs and small striking platforms, suggesting the removal of blanks from cores using a soft-hammer technique. According to researchers, they were aimed at the manufacture of composite tools.

Geometric backed tools are diagnostic of the African Middle Paleolithic. In the south of the continent, these tools appeared in the Fauresmith industry, which is thought to be transitional between the Lower and Middle Paleolithic; in its central part, in the very beginning of the Middle Stone Age, they occurred in the Lupemban industry. However, they were most abundant in the Howiesons Poort stage. Geometric tools appear to have been used as the insets for composite tools such as points, knives, and daggers, which most likely had wooden bases, like those dating back to the Upper Paleolithic and Mesolithic. Many researchers attribute the Howiesons Poort industry to the period between 80 (70) and 50 ka BP.

Archaeological evidence dating to MSA III contains no geometric stone tools; this industry is generally described as more archaic. In southern Africa, the blade technology of the Upper Paleolithic type emerged about 30 ka BP. Thus, no continuity can be traced in the development of the lithic industry in this area: blade technology appeared in the Acheulean (its relation to the Early Middle Paleolithic has not been established yet), then vanished from the record, and emerged again in the Upper Paleolithic. It is impossible to explain such a phenomenon by the replacement of population alone. The emergence and disappearance of blade technologies could have been associated not only with the arrival of new populations, but also with changes in adaptation strategies caused by changing environmental conditions and implying the development of new approaches in primary and secondary lithic reduction (Derevianko, 2015). Lithic assemblages of the Middle Stone Age in southern Africa include no technocomplexes that would somehow correspond to the primary and secondary reduction technologies, or to the toolkit-types, of the Levantine Middle Paleolithic industry.

Another line of the Middle Stone Age industry's development can be traced in the north and northeast Africa. In the north, the Aterian industry can be considered the most distinguishable. In previous issues of this journal, characteristics of the Aterian have already been briefly described (Derevianko, 2015, 2016b).

The Aterian industry is characterized mainly by the use of the Levallois reduction method (McBurney, 1967). Its major strategies involved the production of points, flakes and blades. A diagnostic element of this tradition is represented by stemmed tools. First of all, these include points with retouched tips and stems. Retouch could have been single- and double-row. Stems are observed on side-scrapers, end-scrapers, borers, and burins, which indicates that the Aterian population used multifunctional composite tools and reliable hafting techniques widely. Lithic assemblages associated with the Aterian sites are dominated by scrapers with various modifications, and also include notched-denticulate pieces and backed knives. At a later stage in the development of this culture, a variety of points became popular, including those with a rounded

and slightly pointed stem, a triangular and asymmetrical base, and bifacial foliate points. The Upper Paleolithic tools such as scrapers, burins, blades with blunted edge, and others, as compared to the Middle Paleolithic implements, were scarce.

The dating of the Aterian industry constitutes a challenging problem. In the last century, this lithic industry was radiocarbon dated to 40–20 ka BP. But the application of new dating methods has radically changed the understanding of the issue. The site of Dar es-Soltan near Rabat yielded the OSL-date of 110 ka BP (Barton et al., 2009). The age of sites with a similar lithic industry, located near Temara, is close to this value. A sample derived from the lower Aterian layers at the cave of Mugharet el' Alyia is dated to a range between 62 ± 5 ka BP and 81 ± 9 ka BP (Wrinn, Rink, 2003). The Aterian industry appears to have emerged about 112–110 ka BP and existed for a long time. No features of its influence on the Levantine Middle Paleolithic industries have been recognized. The isolated Aterian sites are known in Arabia. One such locality, with a surface cultural horizon, was discovered at the southwestern edge of the Rub'al Khali desert. The site has yielded 300 Aterian artifacts, which, according to H. McClure (1994), can be dated to 30–20 ka BP.

In North Africa, the finds recovered from the cave of Haua Fteah in Cyrenaica, located between the Maghreb and Egypt, reflect more fully the dynamics in the development of the Middle and Early Upper Paleolithic industries. The thickness of its loose sediments reaches 14 m. On the basis of techno-typological characteristics of archaeological evidence, Ch. McBurney recognized the deposits dating to three periods: pre-Aurignacian, Levallois-Mousterian and Upper Paleolithic (1967). According to his definition, the earliest deposits, pre-Aurignacian, corresponded to the lower stratum (ca 0.5 m). Among lithic implements, McBurney mentions flat prismatic unidirectional and bidirectional cores. The toolkit (about 80 spec.) includes bifacially worked chopper-like pieces, burins, end-scrapers, side-scrapers, fragments of a leaf-shaped point, borers, and other tools. Judging by the major characteristics, the lithic industry from the lower occupational layer in Haua Fteah Cave cannot be associated with the Near Eastern Aurignacian. It is likely to be relevant to the Early or Middle Stone Age of North Africa; owing to scarcity of evidence, it is impossible to draw final conclusions. The industry indicates the use of blade technology for manufacture of stone tools from blades.

In Northeast Africa, two industries were recognized in the Nile Valley: the Early Nubian, falling within MIS 5e (~130–115 ka BP), and the Late Nubian, dating to MIS 5a (~85–74 ka BP) (Mercier et al., 1999; Van Peer, Vermeersch, Paulissen, 2010). The first one is characterized by Lupemban-type bifaces. They are mostly lanceolate and elongated-triangular in shape. Denticulate and notched-denticulate pieces made of blades and flakes are found to be typical of the toolkit. The lithic assemblage is dominated by scrapers with various modifications. The main diagnostic features, distinguishing the Early Nubian Complex from the Late Nubian Complex, are the presence of bifacial tools and the specific preparation of cores.

There is a considerable time-gap between the early and late Nubian complexes. Thus, at the site of Taramsa-1 in the Lower Nile Valley, these two complexes were isolated from each other by a sand deposit dating back to MIS 5d (117 ± 10 ka BP) (Van Peer, Vermeersch, Paulissen, 2010). At Sodmein Cave in Egypt, a Late Nubian horizon was found to overlie an Early Nubian layer. These two lithic industries are thought to be separated by a time span of ~115–85 thousand years. No localities with the Nubian Complex, dating to this chronological interval, are known in Africa (Usik et al., 2013; Rose, Marks, 2014; and others). During this time period, the Nubian Complex appeared in Oman and Yemen, South Arabia. The Nubian Complex assemblage at Aybut Al Auwal in Dhofar, South Oman, was dated to about 106 ka BP (Usik et al., 2013), which, according to the researchers, corresponds to the time when carriers of this industry migrated into the Arabian Peninsula.

The Nubian Levallois technology did not significantly influence the Levantine lithic industry (Rose, Marks, 2014). However, we think that contacts and gene-flow between the Levantine population and the people from the southern regions, who created the Nubian Levallois technology, cannot be ruled out. A low impact of the Nubian technology on the Levantine Middle Paleolithic industry may be due to the movement of human populations from Africa to Arabia along the southern route; and after the environmental conditions in the Near East became arid, migration flows appear to have significantly decreased. People with the Nubian Complex, who migrated from Africa, are associated by researchers with anatomically modern humans (Vermeersch et al., 1998; Armitage et al., 2011; Van Peer, 1998; Usik et al., 2013; Rose, Marks, 2014; and others).

The discussed Early and Middle Stone Age industries of Africa convincingly indicate that there wasn't any intensive migration flow from this continent that could have brought another technology to the Levant and replaced the local population in the region. It is likely that some human groups from Africa—for example, creators of the Nubian Complex (anatomically modern humans)—came into contact with the Levantine populations upon entering Arabia, and assimilation processes involving migrants and indigenous peoples

could have occurred; however, this did not exert a great influence on the Middle Paleolithic industry. Anatomically modern humans (Skhul and Qafzeh) appear to have evolved in the Levant, rather than migrated from Africa.

The second wave of migration from Western Europe is widely thought to have been moving into the Levant in the Late Middle Paleolithic (80–60 ka BP); however, from our point of view, a comparative analysis of lithic industries of the final Middle Paleolithic in the region and the European Mousterian provides no evidence to support this theory.

The origin of the final Middle Paleolithic industry of Tabun B-type in the Levant was associated with the Tabun C-type industry. Having studied the sequence of operation of tool manufacture at Kebara, Meignen and Bar-Yosef came to a conclusion that the unidirectional Levallois technique, which was widespread in the Near East, differed from the Levallois strategies, which were most frequently used in Egypt, Nubia, and Libya. These differences are also revealed by comparison of the Levantine lithic industries with the Middle Paleolithic techno-typological complexes of Western Europe (Meignen, Bar-Yosef, 1992: 144). We suggest that the Palestinian Neanderthals also evolved in the Near East, and were morphologically different from the Western European Neanderthals.

Various Levantine sites dating back to the final Middle Paleolithic produced evidence indicating that the Levallois flaking system with some modifications was used mainly for production of stone tools; whereas contemporaneous localities in Europe revealed various flaking techniques, such as Levallois, Quina, and discoid (Meignen, Bar-Yosef, 2002). This conclusion constitutes, from our point of view, another reason not to attribute the Levantine Middle Paleolithic to the Mousterian industry, and not to assign the Palestinian Neanderthals to those from Western Europe (Derevianko, 2016b).

Anthropological aspect

Over the last 80 years, in the Levant, the caves of Tabun, Skhul, Qafzeh, Kebara, Shanidar, Dederiyeh, and others have yielded a considerable number of hominin remains dating to MIS 5 and 4. As from the first discoveries of anthropological evidence in the caves of Tabun and Skhul, their stratigraphic positions, ages, taxonomic affinity, etc. have become the subject of intense debate. The first researchers of Tabun and Skhul caves put forward different interpretations of bone remains. T. McCown believed that the paleoanthropological finds from Skhul Cave represented two different anthropological types (1934). One group (burials III, VI–X) is earlier, another one (I, IV, and V) is later. Subsequently, this point of view was supported by A. Ronen (1976). He suggested that the 2 m deep deposits of layer B, which yielded the burials, had accumulated over a long period. A. Keith, who also studied these paleoanthropological finds, believed that they could be attributed to Neanderthals, but noted that they were more recent than European Neanderthals. McCown and Keith included the Skhul hominins into the species of *Paleoanthropus palestinensis* (1939). Morphological differences between the paleoanthropological finds from the caves of Tabun and Skhul were explained by possible hybridization between Neanderthals and Cro-Magnons.

F. Howell, however, expressed a somewhat different point of view with regard to these finds. He considered hominins from the caves of Skhul and Qafzeh to be an intermediate link in the evolution between Tabun Neanderthals and early modern humans, and defined them as proto-Cro-Magnons (Howell, 1958). Later he suggested that the mandible from layer C in Tabun Cave could be attributed to *H. sapiens* (Howell, 1999). At present, scientists share the view that two taxa existed in the Levantine Middle Paleolithic: early modern humans (Skhul and Qafzeh) and Neanderthals (Tabun, Amud, Kebara). Owing to the accumulation of archaeological and skeletal evidence from Levant dating back to the Middle and Late Pleistocene, there has been a discussion regarding the continuous or discontinuous development of the Lower, Middle, and Upper Paleolithic industries, as well as the process of human occupation of this region.

Scientists express different views about the issue of continuity in the Levantine Middle Paleolithic industries, and about the fate of early modern humans and Neanderthals (Stringer, Andrews, 1988; Arensburg, Belfer-Cohen, 1998; Shea, 2001; Meignen, Bar-Yosef, 2002; Kaufman, 2002; Hovers, 2006; Hovers, Belfer-Cohen, 2013; and others). Certain researchers believe that both taxa inhabited the Levant simultaneously for a short period of time, and attempt to trace their evolution on the basis of features indicating continuity in the Middle Paleolithic industries. Others reject the possibility that Levantine Middle Paleolithic assemblages originate from the Acheulo-Yabrudian industry, and assume that early modern humans migrated from Africa, and Neanderthals migrated from Europe, each with their own lithic industries.

J. Shea is the most consistent supporter of the idea of discontinuity in the development of the Middle and Upper Paleolithic, whereby early modern humans (Skhul, Qafzeh) were replaced by Neanderthals and the latter by *H. sapiens*, who arrived 50–40 ka BP

from Africa into the Levant. He proposed scenarios of competitive displacement and extinction due to climatic changes, based on the idea that cultural, biological, and social relations among *H. sapiens* were more advanced than among Neanderthals (Shea, 2001, 2003, 2006, 2007, 2008; and others). One must agree with his assertion that no reliable evidence has been currently provided, leaving room for the possibility of coexistence of Neanderthals and early modern humans in the Levant. However, it is by no means certain that all Middle Pleistocene localities in the region have been identified and completely excavated. Undoubtedly, new sites will be discovered in the area, although, perhaps not as impressive as Skhul, Qafzeh, Tabun, Amud, and Kebara. From our point of view, archaeological evidence from the Middle Paleolithic sites in the Levant allows one to suggest the simultaneous dispersal of early modern humans and Neanderthals in the region. We do not consider it necessary to debate with Prof. Shea, but will make an attempt to present briefly our point of view and understanding of the processes associated with the dispersal of hominins in the Levant during the Middle and Late Pleistocene; although we perceive that many points of our hypothesis may draw strong criticism.

Our concept is based on the fact that continuity can be traced in the Lower, Middle, and Upper Paleolithic industries of the Levant, and the indigenous population dispersed across the region over the Lower and Middle Paleolithic. Of course, this did not exclude contacts with populations that migrated to the Near East and the Arabian Peninsula from the adjacent areas of Africa, Iran, and others, because of climatic changes or for other reasons. During short-term contacts, an exchange of genetic material could have taken place. The arrival of populations from Africa or from other regions in the Levant in the Lower/Middle Paleolithic would have resulted in acculturation, and in case of antagonistic relations, in complete replacement of the local people. Such events would have been reflected in evidence from Paleolithic sites. The possible short-term contacts of the autochthonous population with people from the adjacent areas could have resulted in some cultural diffusion. In this case, both a gene-flow and an exchange of some innovations in lithic reduction may have occurred. Such relations might have been established, for example, between the Levantine population and early modern humans, who developed the Afro-Arabian Nubian technocomplex, which has been recorded in Oman on the Arabian Peninsula (Rose, Marks, 2014).

Lithic industry (with the radial primary reduction system) found near the Jubbah paleolake, Arabia, reveals a technological similarity to the Levantine Middle Paleolithic assemblages of Tabun C-type; and short Levallois points with faceted bases, removed from unidirectional convergent flaking surfaces of cores from Jebel Katefeh 1, are technologically close to Levallois points of Tabun B (Crassard, Hilbert, 2013). J. Rose and A. Marks suggest that this was due to either cultural diffusion, or southward invasions by Levantine Mousterian (Neanderthal – **A.D.**) groups at the times of optimal environmental conditions. The researchers also assume that there was some other similar demographic and cultural evidence (Rose, Marks, 2014: 75). Short-term contacts with migrants did not result in the replacement of the local population, but only stimulated a gene-flow and an exchange of some innovations in lithic technology.

Many archaeologists studying the Levantine Middle Paleolithic suggest that two taxa migrated into the area: early modern humans from Africa, and Neanderthals from Southern Europe. Researchers differ in their assessment of the time when anatomically modern humans migrated from Africa to the Levant. According to O. Bar-Yosef, one of the most recognized scientists in the field of the Paleolithic, the exodus of human populations from the African continent could be attributed to the chronological interval of 110–90 ka BP (1987, 2000; and others). But one of his co-authored papers, with consideration of climatic changes in Africa and the Arabian Peninsula, suggests an earlier date for the dispersal of these populations in the Levant, 140 ± 10 ka BP (Frumkin, Bar-Yosef, Schwarcz, 2011). Such a wide range of values explains the difficulties associated with the correlation of dates resulting from different approaches. Use of even one and the same method often provides discordant results. Many scientists suggest that anatomically modern humans entered the Levant from Africa about 120 ka BP (Stringer, 2012; Shea, 2007; and others).

Some skeletal finds come from Ethiopia; and despite the lack of such evidence in the East Sahara and the Arabian Peninsula, as noted by Bar-Yosef et al., the presence of hominins in the region can be inferred from the availability of lithic industries along the supposed migration route (Frumkin, Bar-Yosef, Schwarcz, 2011: 448). From our point of view, archaeological evidence indicating the migration of early modern humans in the Levant at that time has yet to be demonstrated.

Humans could have entered the Levant from Africa following two routes: through the Levantine corridor, and via the mainland and shelf of the Bab-el-Mandeb Strait when sea levels were low. Two lithic industries were developed in Northeast Africa: the Aterian and the Nubian Levallois. We have already discussed above a possible association between the Middle Paleolithic industries in the Levant and northeastern Africa, and came to the conclusion that those represented different

techno-typological complexes. Early modern humans associated with the Nubian Levallois industry did come from Africa to Arabia during MIS 5e and developed the Afro-Arabian Nubian technocomplex (Usik et al., 2013; and others). At this time, Arabia was a region with the most favorable environmental conditions for vegetation; whereas the Sahara, like North Africa as a whole, experienced a period of strong aridization, which occurred after 115 ka BP (Drake, Breeze, Parker, 2013).

The Nubian Levallois technocomplex could have influenced the Levantine Middle Paleolithic only indirectly. The origin of the Levantine Middle Paleolithic industry of Tabun C-type was associated with technocomplexes of the Early Middle Paleolithic of Tabun D-type; and its development did not undergo significant changes, as would be expected in the event of acculturation with the arrival of early modern humans, and even more so if replacement of the indigenous people by migrants had occurred.

In our view, it is unlikely that populations associated with the Nubian Levallois complex, and early modern humans employing a different lithic industry, migrated from Africa to the Levant at the same time. No archaeological evidence thereof exists.

Another hypothesis was suggested in connection with the finds discovered in Misliya Cave in the Levant. This cave is located on the western slopes of Mount Carmel. Excavations carried out at the site revealed occupation layers dating to the final Lower–Early Middle Paleolithic (Zaidner, Weinstein-Evron, 2012). The Middle Paleolithic layers, with an excavation area of 20 m^2, have yielded numerous lithic artifacts. The industry is characterized by laminar flaking, including the Levallois method. The Levallois technique is represented mainly by unidirectional cores sub-triangular in plan, which were used primarily for removing sub-triangular points and flakes. The toolkit includes points and retouched blades. The lithic industry recovered from this cave was similar to that found at Hayonim Cave.

The Middle Paleolithic layer contained skeletal remains: a partial maxilla, four isolated teeth, a phalanx, and a patella. These finds can likely be attributed to early modern humans (Hershkovitz, Zaidner, Weinstein-Evron, 2013). TL age estimates obtained for the 2.5–3.0 m thick Middle Paleolithic layer vary over a wide range. All researchers agree that the finds from Misliya Cave and the Early Middle Paleolithic materials from Tabun and Hayonim caves fall within the timespan between 250–165 ka BP (Valladas et al., 2013). The final Middle Paleolithic of Misliya Cave corresponds to the Early Middle Paleolithic of Tabun C-type, 165 ± 16 ka BP (Mercier, Valladas, 2003).

With regard to some differences in the final Lower Paleolithic and Early Middle Paleolithic industries from Misliya Cave, researchers agree that a new population arrived in the Levant about 250 ka BP. It could have been associated either with Neanderthals from Europe, or with early modern humans from Africa (Valladas et al., 2013).

We think that there is insufficient evidence to draw such a conclusion. The first part of this paper discussed the Late Acheulean blade industry, dating to ca 280 ka BP, recognized in the Kapthurin Formation. The assemblage differs from an earlier blade industry, with an age of over 500 thousand years (recovered from the older deposits of the same formation, and associated with human remains attributed to *H. rhodesiensis*) and shows no similarities to the Acheulo-Yabrudian industry of the Levant. The Middle Stone Age (MSA I), too, is dissimilar to the Levantine Middle Paleolithic. The Middle Paleolithic industries of Northeastern Africa had nothing in common with the contemporaneous Levantine assemblages. Therefore there is no reason to infer that early modern humans migrated to the Levant from Africa 250 ka BP, or to associate the Middle Paleolithic industry from Misliya Cave with the African lithic industries. No known Mousterian industries in Europe could have provided a basis for the development of the Early Levantine Middle Paleolithic. Hence, based on the available archaeological and anthropological evidence, we consider it very unlikely that early modern humans from Africa or Neanderthals from Europe had migrated to the Levant around 250 ka BP. It is much more probable that the Levantine Middle Paleolithic originated from the Acheulo-Yabrudian.

Continuity in the development of the Levantine Middle Paleolithic suggests a hypothesis about the colonization of this region during the Middle and the first half of the Late Pleistocene by populations evolving towards sapienization, resulting in the development of two taxa in the area, including anatomically modern humans and the Palestinian, or Southwest Asian, Neanderthals.

According to some writers, in Africa, the process of speciation appears to have taken place on the basis of *Homo erectus* sensu lato about 0.9–0.8 Ma BP. *H. erectus* gave rise to a new species that has received various names: *H. heidelbergensis*, *H. rhodesiensis*, archaic *H. sapiens* (Rightmire, 1996, 1998; Bräuer, 2008, 2010, 2012; Hublin, 2001, 2009; and others). We will now outline the fate of a new taxon, *H. heidelbergensis*/*rhodesiensis*, in Africa and Europe. Many specialists consider it ancestral to anatomically modern humans*. Skeletal finds from Africa and Eurasia, dating to the Middle and the first half of the Late Pleistocene, display a mosaic of taxonomic traits and high variability. Therefore, the many fossils are interpreted in completely

*This issue is discussed in numerous publications.

different ways, and it is absolutely unrealistic to consider all viewpoints.

There is no single scenario of evolution from *H. heidelbergensis* to anatomically modern humans and to Palestinian Neanderthals. Anthropologists often assign various taxonomic diagnoses to the same finds, which is quite understandable. It is more difficult to understand why hominins from the same site, who were broadly contemporaneous and used the same lithic industry, are sometimes attributed to different species. One of the reasons may be the mosaic morphology of the Middle Pleistocene hominins and the lack of criteria for assessing the taxonomic importance of various morphological traits. For example, J. Schwartz and A. Tattersall believe that Qafzeh 1, 2, 9, and 11 represent *H. sapiens*; but other individuals from the same site cannot be unambiguously attributed to that species (2005: 600).

Archaeologically, it is unlikely that two different species or subspecies using the same lithic industry coexisted at one and the same site. Biologically, it seems more logical to explain the presence of individuals showing different "taxonomic" affinities at one and the same site by polymorphism within a single population.

We will now briefly outline a hypothesis regarding the evolutionary development of *H. heidelbergensis/ rhodesiensis* in Africa and Europe.

In Africa, the evolution of this species is evidenced by fossils such as Bodo, Kabwe 1, 2, Saldanha, Ndutu, Eyasi 1, 2, Salé, Elandsfontein, etc., spanning the interval between 600–200 ka BP. This evidence reflects a mosaic pattern of archaic and modern features. Anthropologists differ in their taxonomic assessments of these finds, and the role they played in the development of the human lineage: recognition of *H. sapiens* sensu lato; classification of a polymorphic species, *H. sapiens*, into several separate sub-species; recognition of three different communities or groups, etc. (Bräuer, 2010, 2012). In our view, *H. heidelbergensis* and *H. rhodesiensis* represent the same polytypical species, playing an important role in human evolution: in Europe, it gave rise to *H. neanderthalensis*; in Africa, to *H. sapiens*; in the Near East, to two closely related species—*H. sapiens* and Palestinian Neanderthals.

Skeletal remains attributed to early archaic *Homo sapiens* were found mainly in East Africa; others come from North and South Africa. In this region, the transition from the early archaic to anatomically modern *H. sapiens* occurred as a continuous anagenetic evolution, without any speciation events (Bräuer, 2008, 2012; Mbua, Bräuer, 2012).

The origin of anatomically modern humans is a contentious issue. G. Bräuer attributes all fossils within the 300–200 ka BP interval to the intermediate late archaic *Homo sapiens* group. Members of this group are KNM-ER 3884 from Ileret (270 ka BP), Laetoli 18 (250 ka BP), Eliye Springs (date uncertain), Florisbad (260 ka BP), and Jebel Irhoud 1 and 2 (190–170 ka BP). Continuity between early and late archaic *Homo sapiens*, in Bräuer's view, is documented by the Rabat fossil (250 ka BP), and the transition from the archaic to the early modern *H. sapiens*, by Omo 1 and 2, Herto, Singa, etc. (Bräuer, 2008, 2012; Mbua, Bräuer, 2012). G.P. Rightmire believes that for approximately 800 thousand years after the emergence of *H. heidelbergensis*, this taxon evolved in two directions: toward *H. neanderthalensis* and toward *H. sapiens*, eventually giving rise to those two taxa by the end of the Middle Pleistocene. He views Florisbad, Laetoli, and Jebel Irhoud as a stage in the emergence of *H. sapiens* in Africa. At the beginning of the Late Pleistocene, in the process of speciation, early modern humans such as those from Klasies River Mouth, Skhul, and Qafzeh, definitely emerged (Rightmire, 2001, 2009; and others).

In Europe, the Acheulean industry appears about 600 ka BP together with *H. heidelbergensis*. This, it appears, was the starting point of their evolution toward *H. neanderthalensis*, who appeared 450 ka BP or somewhat earlier (Hublin, 1998). The results of mitochondrial DNA sequencing suggest that hominins from Sima de los Huesos, who lived about 430 ka BP (Arsuaga et al., 2014)—or about 530 ka BP, according to another estimate—were more closely related to Denisovans than to Neanderthals, although morphologically they shared a number of traits with the latter* (Meyer et al., 2014). Later, the analysis of nuclear DNA from two bone samples indicated affinities of Sima de los Huesos humans with Neanderthals rather than Denisovans (Meyer et al., 2016). Specifically, the nuclear DNA extracted from the AT-5431 femur and from an incisor found at Sima de los Huesos show those humans to be close to early Neanderthals or to a group ancestral to these, but not to Denisovans. Geneticists believe that the mitochondrial gene-pool of Neanderthals had undergone significant changes after their separation. The whole genome sequencing showed that the most recent common ancestor of Neanderthals and Denisovans had lived 473–381 ka BP.

The results of DNA sequencing warrant two tentative conclusions. First, members of the *H. heidelbergensis* taxon, who were associated with the Acheulean industry and migrated from the Near East to Western Europe some 600 ka BP, had retained affinities with Denisovans in their mitochondrial genome, and with Neanderthals

*Regrettably, no cranial or postcranial bones suitable for reconstructing the physical type of Denisovans were found in this cave.

in their nuclear genome. Alternatively, the Sima de los Huesos population belonged to the Neanderthal lineage, which had preserved certain Denisovan markers in its mitochondrial genome.

In 1993, human remains covered with calcite were discovered near Altamura in southern Italy (Lari et al., 2015). The mitochondrial DNA of this individual reveals unambiguous Neanderthal affinities. Its age estimates, according to the Th/U-method, are 130 ± 20 and 172 ± 15 ka BP. Apparently, Denisovan markers had disappeared by that time. Around 270–250 ka BP, the Levallois primary reduction technique emerged in Western Europe. This, in our view, may be related to a migration from the Near East in the final Lower or Early Middle Paleolithic. Or, the Levallois technique might have been an outcome of short-term contacts, or a diffusion of innovations. Therefore, the Western European Mousterian may have been influenced by the Acheulo-Yabrudian complex of the Levantine final or Early Middle Paleolithic.

In Levant itself, the evolution of *H. heidelbergensis* proceeded in a different fashion. The skeletal evidence thereof is scarce, and mostly relates to Israel. The earliest remains come from the Lower Paleolithic site of Ubeidiya, dating to 1.4 Ma BP. The bifacial tools from Ubeidiya, which are the earliest in Eurasia, testify to the first migration wave of people associated with the bifacial industry. Among the finds from Ubeidiya are several cranial fragments (UB 1703, 1704, 1705, 1706), an incisor (UB 1700), and a molar (UB 1701). P. Tobias (1966) attributed them to the genus *Homo*, and E. Tchernov (1987), described them as "*H. cf. erectus*". The subsequent examination of the fossils yielded a worn right lower lateral incisor (UB 335), which revealed some affinities with *H. ergaster* (Belmaker et al., 2002). In our view, the Ubeidiya humans were members of the *H. erectus* taxon.

Another Paleolithic locality in Israel is Gesher Benot Ya'aqov where the 34 meter thick sedimentary sequence spans the period of MIS 20–18, or at least 50 thousand years (Feibel, 2004; see (Derevianko, 2016a) for a review of the vast literature). The abundant and diverse lithic industry, according to certain experts, falls into four basic types: bifaces (hand-axes); cleavers; flakes and flake tools; cores and core tools. In our view, the Gesher Benot Ya'aqov industry may have originated from that of Ubeidiya, even though they are separated by a huge chronological gap. The excavator of Ubeidiya, N. Goren-Inbar, claims that this industry cannot be described as either African or Asian: its peculiarities are mostly due to local origin, and only partly to external influences (1992: 67).

The Gesher Benot Ya'aqov, we believe, could be attributed to *H. heidelbergensis*. About 800 ka BP, members of this taxon migrated from Africa to Eurasia and began to disperse across this continent. *H. rhodesiensis* continued to evolve in Africa, eventually resulting in the emergence of *H. sapiens* about 180–150 ka BP. *Homo heidelbergensis*, who migrated from Africa to Levant, could have been the common ancestor of three closely related but still distinct taxa: *H. sapiens*, *H. neanderthalensis*, and Denisovans (Stringer, 2012).

Having migrated from Africa to the Levant, *H. heidelbergensis* evidently encountered the local *H. erectus* populations. The contact resulted in acculturation, whereby the immigrants borrowed many elements of the autochthonous lithic industry. Eventually the Gesher Benot Ya'aqov industry acquired many features opposing it to the African Acheulean. The fossil record of the Levant is scanty, and new finds are needed to test this hypothesis.

The diversity and mosaic nature of human evolution in Africa and Eurasia in the Pleistocene are addressed in numerous studies. The central issue concerns the ways those humans progressed toward *H. sapiens*, whether without speciation (within a single evolving species *H. sapiens* sensu lato with several subspecies) or by splitting into several species such as *H. heidelbergensis*, *H. helmei*, and *H. sapiens* (Bräuer, 2012).

Human fossils have been unearthed from three more Middle Pleistocene sites in Israel. As early as 1925, a frontal bone, a right zygoma, and an incomplete sphenoid were found in the Mugharet el-Emireh cave, with an industry contemporaneous with the Amudian. They are known as the Zuttiyeh remains, and their taxonomic attribution is debatable.

According to B. Vandermeersch, the Zuttiyeh individual was an archaic *H. sapiens*. Rightmire contends that the Zuttiyeh frontal could belong either to an early Neanderthal or to a direct ancestor of Skhul and Qafzeh humans. The Acheulo-Yabrudian industry of this site, dating to 350–300 ka BP, suggests that this was an archaic African population similar to Bodo, Elandsfontein, Kabwe, Eyasi, and Ndutu (Rightmire, 2009). Bräuer (2008) associated Zuttiyeh with early archaic *H. sapiens*.

Freidline et al. (2012: 237–238) have analyzed the competing views regarding the Zuttiyeh remains, and proposed four hypotheses.

The first hypothesis is that Zuttiyeh was a local member of a Middle Pleistocene species *H. heidelbergensis/rhodesiensis*, widely distributed in Africa and Europe and apparently ancestral to both Neanderthals and anatomically modern humans.

The second hypothesis is related to the accretion model, which assumes a prolonged evolution of the Neanderthal lineage in Western Europe. Zuttiyeh might have been related to its southwestern members, defined

as either *H. neanderthalensis* or *H. heidelbergensis* sensu stricto, a chronospecies antecedent to Neanderthals.

The third hypothesis assumes that there was a regular gene-flow between Africa and the Near East in the Middle and Late Pleistocene. In this context, Zuttiyeh was the predecessor of *H. sapiens* in Africa.

The fourth possibility is that Zuttiyeh and other Near Eastern hominins (Skhul, Qafzeh, and Neanderthals) either belonged to the regional *H. sapiens* lineage or, like African Middle and Late Pleistocene hominins "with deep roots", were ancestral to *H. sapiens*. If so, Zuttiyeh must reveal affinities with Near Eastern hominins (Ibid.: 238).

Indeed, researchers conclude that Zuttiyeh does resemble Near Eastern Neanderthals such as Shanidar V, and early humans such as Skhul V; but also European Middle Pleistocene hominins like Arago XXI. According to Freidline et al., their results do not warrant an accurate taxonomic diagnosis of Zuttiyeh, but suggest that this fossil represents a population ancestral to both Neanderthals and *H. sapiens*, or an unspecified population that existed immediately after the split between those two species (Ibid.).

A femoral shaft and a worn lower molar from layer E of the Tabun Cave have been attributed to archaic humans (Trinkaus, 1995).

Finds from Qesem Cave are more informative (Hershkovitz et al., 2011). Its rich lithic industry is Amudian and autochthonous, showing no affinities with either African or European assemblages (Barkai, Gopher, Shimelmitz, 2005; Gopher et al., 2005). Fossils include maxillary and mandibular teeth. Hershkovitz et al. have proposed three hypotheses to account for their morphology.

(1) Inhabitants of Qesem Cave were members of an archaic human population who lived in the Near East 400–200 ka BP; their teeth, despite certain plesiomorphies, indicate closer affinities with Skhul and Qafzeh than with Neanderthals (Hershkovitz et al., 2011). This idea, Hershkovitz et al. believe, is supported by archaeological finds, specifically by the Levallois industry with a high share of blades and blade tools, testifying to the local sources of the Amudian.

(2) The Neanderthal lineage in southwest Asia was as ancient as in Europe, where it emerged in the Middle Pleistocene. This, in the authors' view, is contradicted by the fact that anatomically modern remains from Skhul and Qafzeh are later than those from Qesem, but earlier than most Neanderthal fossils from the Levant.

(3) This hypothesis proceeds from the fact that mandibular teeth from Qesem were found in deeper layers of the cave than were maxillary teeth; but are smaller than the latter and, unlike them, show no plesiomorphies. This may suggest that upper and lower teeth represent various taxa, testifying to population replacement.

Misliya Cave yielded an Early Middle Paleolithic industry dating to 250–165 ka BP, a maxillary fragment with intact I^2–M^2, four separate teeth, a phalanx, and a patella, representing early modern humans or Neanderthals (Valladas et al., 2013).

In sum, the fragmentary human fossils from the Levant, broadly dating to 350–150 ka BP, do not warrant unambiguous diagnosis at the species level, but exhibit both apomorphic and plesiomorphic traits. Possibly they represent the next stage in the evolution of *H. heidelbergensis*, combining traits of early *H. sapiens* and *H. neanderthalensis*.

It is also possible that *H. heidelbergensis* of the Levant, like those of Sima de los Huesos, retained genetic affinities with Denisovans. This idea is supported by an eastward migration from the Levant ca. 350–300 ka BP, reaching the Altai ca. 280 ka BP (Derevianko, 2001). Denisovan DNA was extracted from a fossil found in layer 22 of Denisova Cave, and the presence of Denisovans is archaeologically documented throughout most of the stratigraphic sequence up to layer 9.

Importantly, because the Sima de los Huesos humans combined Neanderthal and Denisovan features in their gene-pool (Meyer et al., 2014), *H. heidelbergensis*, who had migrated from Africa to Levant about 800 ka BP, may have hybridized with local populations and taken part in the acculturation process. Subsequent evolution eventually resulted in the emergence of three related taxa: *H. sapiens*, Neanderthals, and Denisovans. The Denisovan genome included a signal of an unknown hominin, who had diverged from the common lineage ca. 1 million years ago (Prüfer et al., 2014). Archaeologically, this divergence is paralleled by the Acheulean migration from Africa to Levant about 1.4 Ma BP, as documented by the Ubeidiya industry. Hybridization may account for genetic affinities between *H. heidelbergensis* and Denisovans.

With regard to later Levantine fossils from the MIS 5–4 timespan, two views have been proposed. Certain experts believe that they all represent a single population close to early modern humans (Kramer, Crummett, Wolpoff, 2001; Arensburg, Belfer-Cohen, 1998; and others), whereas others attribute the Tabun, Amud, and Kebara remains to Neanderthals, and those from Skhul and Qafzeh, to early *H. sapiens* (Tchernov, 1992; Jelinek, 1992; Vandermeersch, 1992, 1997; Stringer, 1992, 1998; and others).

The stratigraphic position, age, and taxonomic status of certain finds, especially those from Tabun, are disputable. Fossils from layer C include an incomplete female skeleton (Tabun I), a mandible (Tabun II), an incomplete femur (Tabun III), metacarpals, and hand

phalanges (Tabun IV–VI). The female skeleton is believed to have been associated with the upper part of layer C, although it was found 85 cm above the mandible, and D. Garrod did not exclude its redeposition from layer B (The Stone Age…, 1937). This idea was supported by certain later researchers (Bar-Yosef, Callander, 1999; and others).

The Tabun I skeleton and the Tabun II mandible are sometimes attributed to Neanderthals (Stefan, Trinkaus, 1998; Trinkaus, 1987; and others), and sometimes to anatomically modern humans of Skhul and Qafzeh (Quam, Smith, 1998; Rak, 1998). The controversy stems from the lack of agreement regarding the diagnostic criteria of *H. sapiens*. The discrepancies are especially acute in the interpretation of the Levantine fossils of the last interglacial period and the beginning of the last glacial period. This may be partly due to the paradigm shift in the study of human evolution in the last 50–70 years, following the extension of the archaeological and biological databases, the acknowledgment of the early age of *H. sapiens*, and the appearance of paleogenetic data.

Until the mid-20th century, the influential unilinear theory held that human evolution had proceeded in stages such as Australopithecines—early archaic *Homo* (*H. ergaster*, *habilis*, *erectus)*, broadly termed "Archanthropus"—late archaic *Homo* (*H. neanderthalensis*, or "Paleoanthropus")—anatomically modern humans (*H. sapiens*). All fossil humans who had lived in Africa and Eurasia before 150 ka BP, but later than early archaic *Homo*, were often merged under the "Paleoanthropus" category. In the late 1900s, Neanderthals were subdivided into pre-Würmian ("atypical"), "classic" Neanderthals of the Würm glaciation, and those of Palestine. Although hominins of the late, middle, and early Upper Pleistocene were no longer called Neanderthals, their Middle Paleolithic industry in Northern Africa was still referred to as Mousterian.

In the late 1900s, when Neanderthal markers were believed to be virtually absent in modern human DNA, the idea that Neanderthals were but a side branch seemed to have gained critical support. Even *H. erectus* was sometimes regarded as an evolutionary dead end, resulting in a huge gap between Australopithecines and *H. sapiens*.

Eventually, two competing hypotheses were elaborated. According to the first, monocentric view, anatomically modern humans originated in Africa and dispersed across Eurasia between 80 (or 70) and 50 ka BP, with complete replacement of archaic populations or with some hybridization. The alternative multiregional hypothesis has been supported by new results of Neanderthal DNA sequencing, and by facts relating to the new sister species of Neanderthals, the Denisovans. These facts indicate a small-scale hybridization between several hominin subspecies in the Late Pleistocene. S. Pääbo (2014) speaks of a "metapopulation", or a macrospecies, which included Neanderthals, Denisovans, anatomically modern humans, and other groups engaged in occasional or regular interbreeding.

We suggest a new hypothesis that takes into account the results of genome sequencing, recent archaeological and anthropological discoveries, and the views of other specialists in human evolution. A polytypic species, *Homo heidelbergensis/rhodesiensis*, emerged about 800 ka BP in Africa. In the Middle Pleistocene, as a result of the evolution and divergence of *H. rhodesiensis* in Africa (as indicated by differences between lithic industries found in the south, east, and north of the continent), as well as gene-flow, anatomically modern humans appeared 200–150 ka BP. In Europe, *H. heidelbergensis* evolved into *H. neanderthalensis*, showing a greater variability. In the Near East, predominantly in the Levant, three genetically and taxonomically close taxa emerged on the basis of *H. heidelbergensis*: anatomically modern humans, Palestinian Neanderthals, and Denisovans. About 300 ka BP, populations using blade/Levallois technology (ancestors of Denisovans) migrated from the Levant into Eastern Eurasia. In the Altai and, judging by the lithic industry, in Central Asia, migrants from the Near East (Denisovans) with certain Neanderthal components in their gene-pool contributed to the origin of *H. sapiens altaiensis*. In East and Southeast Asia, beginning from the initial dispersal of *H. erectus* in the region, convergent evolution towards *H. sapiens* occurred. Certain populations from the Near East advanced as far as Southeast and East Asia. As a result, some modern populations display Denisovan and Neanderthal alleles inherited from late *H. heidelbergensis*, who had migrated from the Levant about 300 ka BP. Recent findings suggest that the development of modern humans was based on *H. sapiens africanensis*. Members of this ancestral species eventually migrated to Eurasia. In Europe, they hybridized with *Homo sapiens neanderthalensis*; in the southern part of North and Central Asia, with *Homo sapiens altaiensis*; and in East and Southeast Asia, with *Homo sapiens orientalensis* (Derevianko, 2011). These processes co-occurred with acculturation (Ibid.). It is possible that new sub-species of *Homo sapiens*, which likewise contributed to the gene-pool of the modern mankind, will be recognized in Eurasia in the future.

Of course, new archaeological and anthropological data are needed to test this hypothesis. Sequencing the DNA from Skhul, Qafzeh, Amud, Kebara, Manot, and, if possible, from Zuttiyeh, Qesem, and Misliya would be of critical importance.

In our view, the already available evidence speaks in favor, not only of continuity in the development of the Lower and Middle Paleolithic industries, but also of genetic continuity between hominin populations that dispersed across the region in the Middle and Late Pleistocene.

Despite the scarcity of human fossils from the Levant dating to MIS 11–6, and the divergence of hypotheses, the fact that no other population with a different lithic industry appears to have migrated to this region suggests the following assumption. Populations with the Acheulean industry (*H. heidelbergensis*), which had migrated from Africa into the Levant about 800 ka BP, stayed in the area for several hundred thousand years. Adaptive divergence, gene-flow, and other evolutionary processes, as well as short-term contacts with populations from adjacent regions, resulted in the emergence of modern humans, represented by Skhul and Qafzeh fossils; and of Palestinian Neanderthals, represented by Tabun, Amud, and Kebara fossils. This hypothesis is supported by a homogenous Levantine lithic industry, which falls within the timespan between 400–40 ka BP.

At the Acheulo-Yabrudian stage, a new taxon appeared in the region, as evidenced by finds from Qesem Cave. Its members resembled later humans from that area—Skhul and Qafzeh (Ben-Dor et al., 2011). The abundance of hominin remains from the Middle Paleolithic layers in the Levantine caves (Qafzeh, Skhul, Zuttiyeh, Tabun), and the fact that the Acheulo-Yabrudian complex has no parallels in Africa, indicate that both biological and cultural evolution proceeded in situ (Ibid.: 9). Researchers conclude that a new human species emerged in the Levant. This conclusion supports our cautious hypothesis about the evolution of *H. heidelbergensis* in the Levant during MIS 5–4.

Skeletal evidence from Skhul, Qafzeh, Tabun, Amud, and Kebara indicates the accretion of modern apomorphies and the decrease of plesiomorphic features. Modern apomorphies appear to be more strongly pronounced in Skhul and Qafzeh humans than in those from other caves. Both anatomically modern humans and Neanderthals of the Levant are highly variable and mosaic. Let us discuss this issue in more detail.

Assessing the taxonomic status in this case is difficult, not only because different criteria are used, but also because of the problems related to the stratigraphic context of the finds. R. Grün et al. estimate the age of Skhul, Qafzeh, and Tabun at 130–100 ka BP. The presence of both early modern humans and Neanderthals in the Levant during MIS 5 complicates the attempts to separate these populations in time and space (Grün et al., 2005: 332). At the same time, the ESR date of dental remains from Tabun C1 is 120 ± 16 ka BP, suggesting that the tooth-fragment probably got to Layer C from Layer B (Grün, Stringer, 2000). The last assumption is supported by the re-examination of the excavation's diary (Bar-Yosef, Callander, 1999).

There is no agreement about the stratigraphic position of fossils from Tabun, their age, and their taxonomic affinity. Some researchers attribute Tabun I to Neanderthals, others to anatomically modern humans. Some think that the mandible, which was found 85 cm below Tabun II and can be reliably associated with Layer C, reveals similarity to Skhul and Qafzeh counterparts (Quam, Smith, 1998; Rak, 1998); others believe that it can be attributed to a Neanderthal (McCown, Keith, 1939; Trinkaus, 1987, 1993; Ronen, 2012; and others).

Stringer et al. believe that all fossils from Tabun come mainly from Layer C and are associated with Neanderthals (Schwarcz, Simpson, Stringer, 1998). Tabun Layer C yielded a TL-date of about 150–190 ka BP and an ESR-date of about 105–160 ka BP; but the date within 130 ka BP seems to be more correct. Hence, Neanderthals did not migrate into the Levant from Western Europe 75 ka BP, but had occupied Tabun Cave before *H. sapiens* appeared at Skhul and Qafzeh. This does not necessarily mean that Neanderthals arrived in the Levant earlier than did anatomically modern humans. Some suggest that early modern humans, whose skeletons were discovered in Skhul and Qafzeh, as well as the Tabun I Neanderthal, are contemporaneous (Grün et al., 2005; Ronen, Gisis, Tchernikov, 2011). And, as many believe, the morphology of Skhul and Qafzeh humans is unambiguously modern.

Human remains of ten individuals varying in age—eight male and two female—were recovered from Skhul Cave. Three cultural layers were revealed. Layer A included mixed Natufian, Aurignacian, and Late Upper Paleolithic industries. Layer B, divided into the upper sub-layer B1 and the lower B2, produced all human fossils and Middle Paleolithic artifacts. Layer C yielded few artifacts (McCown, 1934). According to Grün et al. (2005), if one assumes that the sedimentation of fossil-bearing deposits occurred over a relatively short period, then their best age estimate would be 135–100 ka BP.

Skhul fossils demonstrate a mosaic pattern of cranial and postcranial morphology. This may account for the fact that until recently, these remains were associated with Neanderthals, who had allegedly migrated to the Levant from Europe (Vandermeersch, 1981) or Africa (Andrews, 1984).

On the basis of the variable morphology of the fossils and their different stratigraphic positions, McCown and Keith (1939) subdivided the Skhul population into two chronological groups: early (III and VI–X) and late (I, IV, V). A. Ronen (1976) subscribed to this view. According to D. Kaufman (2002), the existence of these

two groups does not necessarily imply that there was a long chronological gap between them.

The cave-dwellers of Skhul show anatomically modern characteristics, such as tall stature (173–179 cm), and very low orbits combined with broad faces (Zubov, 2004). In certain respects, though, they resembled Neanderthals.

The best-preserved skeleton is Skhul V, a male aged 30–40, tall and gracile. His cranial capacity is 1518 cm^3, the vault is high, the orbits low, and the face is rather high and broad*. The metric and non-metric traits of the supraorbital area of Skhul V links this individual to Mladeč V and Brno I, indicating a morphology intermediate between Neanderthal and modern. The zygomatic bones are morphologically modern, and the angle between the frontal and the temporal processes (115º) also falls within the modern range. The shape of the frontal process links Skhul V to Oberkassel 1 and Kabwe, whereas the angles defining neurocranial shape reveal affinities with Amud, Kabwe, and Ngandong XI. The mandible is in some respects similar to Amud, Le Moustier 1 and 2, Oberkassel 1 and 2, and other Neanderthals.

Cranially and post-cranially, too, Skhul V has retained a number of Neanderthal features. Other Skhul individuals combine evolutionarily derived and ancestral traits, their proportion in the face, braincase, and postcranial bones being different. According to S.V. Vasiliev (2006: 163), the results of the statistical analysis support the conclusion that facial traits evolved more rapidly than did those of the braincase, and the evolution of dimensions proceeded at a higher rate than that of descriptive structural characteristics.

The Qafzeh skeletal series is larger than that from Skhul, numbering fifteen anatomically modern individuals (Ronen, 2012). The TL-date generated from charred flint is 92 ± 5 ka BP. Direct dating by ESR-method yielded more reliable estimates: 100 ± 10 and 120 ± 8 ka BP (Grün, Stringer, 1991).

The best-preserved remains are those of Qafzeh IX, a female aged about twenty. Beside her, an infant was buried: apparently this was a double burial. The cranium is characterized by a high vault, a gently sloping forehead, a relatively weak supraorbital relief, a strongly protruding chin, a round occiput without a bun or sharp curvature, an anatomically modern zygomatic area, a canine fossa, thin cranial walls, and a cranial capacity of 1554 cm^3 (Zubov, 2004: 348). The well preserved Qafzeh VI cranium is likewise anatomically modern. Generally, the Qafzeh individuals are closer to anatomical modern humans than are those of Skhul.

*The concise description herein of Skhul V is based on: (Zubov, 2004; Vasiliev, 2006).

The excavations in the Ras el-Kelb Cave, situated in the homonymous mountain range, have yielded a Middle Paleolithic industry reminiscent of Tabun C: flakes detached from discoid cores, various types of scrapers, notched-denticulate pieces, and a few Levallois points and blades (Copeland, 1978). In the same horizon, three human teeth were found. One of them, apparently that of a 16- to 20-year-old male, is a large premolar combining anatomically modern and Neanderthal traits (Vallois, 1962). Two other teeth, an upper second molar of a person aged about 23, and an upper second deciduous molar, appear more modern than Neanderthal teeth.

Anatomically modern humans of the Near East coexisted with Neanderthals. Western European Neanderthals of the 120–40 ka BP range were cranially and postcranially polymorphous, while displaying a progressive accretion of derived traits. Near Eastern Neanderthals such as those from Tabun, Amud, Kebara in Israel, Shanidar in Iraq, and Dederiyeh in Syria differ from their later Western European counterparts by a lesser expression of Neanderthal apomorphies, and by being closer to anatomically modern humans.

The Tabun I female was mentioned above. Her stature was 154 cm, her cranial capacity 1271 cm^2. The cranium is low, the forehead sloping, the supraorbital torus strong, and there is almost no chin. The mandibular ramus is wide and robust, with a high and wide coronal process and a shallow notch. These (and other) peculiarities suggest that among all the individuals buried in Mount Carmel caves, Tabun I is the closest to Western European Neanderthals. The same is true of other fragmentary human remains from Tabun Cave.

Skeletal elements of several individuals were unearthed from Amud Cave. Amud I, a young male buried according to a special rite, is the best preserved. The remains of other individuals from that cave are fragmentary, and do not warrant taxonomic assessment.

Amud I has been described by several anthropologists, who noted both plesiomorphies and apomorphies in its morphology, and compared its taxonomic status with that of African and European specimens. The individual was some 180 cm tall, had a gracile skeleton, and a cranial capacity of 1740–1800 cm^3. Descriptively, his supraorbital region attests to Neanderthal affinities (low glabella and virtual absence of supraorbital sulcus at the ophrion level) (Vasiliev, 2006: 150–151). Metrically, Amud I resembles Shanidar I, Skhul IV, Arago XXI, and Tabun I. There is a zygomatic notch, which is not typical of Neanderthals, and there is no eminence at the base of the frontal process of the maxilla. Dimensions and indices of the zygo-maxillary region link Amud I with Oberkassel 1, Sungir 1, Fish Hoek, and Skhul V. The trigonometry of the facial skeleton reveals

similarities with Skhul V, Florisbad, Sungir 1, and Gibraltar 1. The mandible shows a modern tendency in certain aspects; even an incipient chin is present. Vasiliev notes several more traits in which Amud I resembles both Neanderthals and anatomically modern humans. Bräuer (1984) describes Amud I as a Late Archaic *Homo sapiens*.

Descriptions of Amud I published by other anthropologists suggest that this individual combines characteristics of classic Western European Neanderthals and early anatomically modern humans of Africa, Levant, and Eastern and Central Europe. It is unlikely that such a mosaic pattern was caused by hybridization. In our view, it mirrors evolutionary processes, such as adaptation and divergence, within a single polymorphic species *H. heidelbergensis* in Africa and Europe.

The Amud I skeleton was found in the upper part of the stratigraphic sequence spanning the 70–53 ka BP interval (The Amud Man…, 1970). Its probable age is somewhat above 50 thousand years.

The most contentious find is Kebara 2. The remains are those of a 25–35-year-old male, who was buried in a shallow pit in a supine position with arms folded on his chest. The cranium was missing, but a mandible and postcranial skeleton are well preserved. The stature is tall by Neanderthal standards (above 170 cm). The skeleton is more robust than that of Amud I. The hyoid has a modern shape, indirectly evidencing capacity for speech. The chin is incipient. Most postcranial bones have a modern appearance. The estimated age of the burial is approximately 60 thousand years.

Five crania and postcranial remains in a varying state of preservation were found in the Shanidar Cave. The best preserved cranium, Shanidar I, like other remains from that locality, shows numerous Neanderthal traits. Generally, in our view, the Shanidar individuals are intermediate between Palestinian and Western European Neanderthals.

Remains of fifteen individuals were unearthed from the intrusive layers of the Dederiyeh Cave. Two skeletons from burials 1 and 2 are those of children aged about two. More than a half of the other remains, too, are infantile (Akazawa et al., 1999). The skeletons from burials 1 and 2 are the best preserved. While differing to some extent, they combine Neanderthal and anatomically modern features. Dederiyeh 2 has more gracile postcrania than does Dederiyeh 1, and displays more pronounced cranial and dental affinities with Western European Neanderthals. Specifically, there is no chin. Dederiyeh 1 shows incisor shoveling and a Carabelli cusp. Remains from Shanidar and Dederiyeh, like those from Mount Carmel caves, then, display a combination of Neanderthal and anatomically modern traits.

On the basis of a brief review of anthropological evidence from the Levant, dating to the Middle and the first half of Late Pleistocene, some conclusions may be drawn.

1. To date, archaeological data do not support the idea of two Levantine lineages evolving in parallel on the basis of *H. heidelbergensis*, viz. anatomically modern humans and Neanderthals. However, such a scenario cannot be excluded, given the continuity between the Acheulean and Middle Paleolithic industries.

2. Hominin remains from the 0.3–0.2 ka BP interval (Zuttiyeh, Qesem, Misliya) reveal a greater expression of modern apomorphies and a lesser expression of plesiomorphies.

3. At the turn of 130–120 ka BP, two lineages, *Homo sapiens* (Skhul, Qafzeh) and *Homo neanderthalensis* (Tabun, Amud, Kebara), can already be recognized; members of the latter lineage demonstrate features opposing them to Western European Neanderthals.

4. The Acheulo-Yabrudian and the Levantine Middle Paleolithic industries do not indicate migration from Africa or Europe into the region. Two taxa representing two evolutionary lineages, and employing similar lithic industries, appear to have coexisted in the Levant. This, of course, did not exclude their short-term contacts with populations from adjacent regions and a gene-flow between them.

5. Evolution of modern humans, like that of Neanderthals, occurred in the Levant. Other regions of the Near East were involved in this process as well. In terms of morphology and socio-cultural context, the Palestinian Neanderthals were closer to early modern humans of the Levant, than to Western European Neanderthals. This is evidenced, not only by the lithic industry, but also by burials showing elements of rituals, as well as by other manifestations of social solidarity (the burial of a one-handed man in Shanidar).

6. Levantine populations representing two evolutionary lineages reveal a stronger mosaic pattern and greater variability than do European Neanderthals.

The fate of early modern humans and Levantine Neanderthals after 50 ka BP is debatable. One can agree with the conclusions made by B. Arensburg and A. Belfer-Cohen on the basis of a comparative analysis of Middle Paleolithic human remains in Israel: those of "Neanderthals" do not display a complete set of Neanderthal features, whereas those attributed to anatomically modern humans do show certain Neanderthal traits. Early modern humans, like "Neanderthals", demonstrate high morphological variation. Facts demonstrate that "Neanderthals" and anatomically modern humans occupied the same areas, sometimes even the same caves (Arensburg, Belfer-Cohen, 1998: 320). Therefore it is difficult to agree that

early modern humans were displaced from the Levant by Neanderthals, or vice versa (Shea, 2001, 2007, 2008; and others).

Remains of anatomically modern humans can be approximately dated to 130–75 ka BP, and the earliest Neanderthal fossils (Tabun I, II, etc.) to 130 (125) ka BP; i.e. two related taxa coexisted in the Levant at the beginning of the Early Pleistocene. All researchers note a high variability and a highly mosaic pattern in many morphological features, which supports our hypothesis about the possible evolution of the two related taxa in the Levant during the Middle Pleistocene. They reveal similarity, not only in physical features, but also in the characteristics of stone tools, and in the burial rite.

Few remains of Levantine early modern humans are later than 75 ka BP, and remains of Palestinian Neanderthals contemporaneous with Tabun I, Kebara, and Amud are few also. However, Paleolithic sites discovered in the Levant suggest that the earlier indigenous population lived there throughout the Late Pleistocene, and the homogenous Middle and Upper Paleolithic industries do not testify to any migrations from Africa or Europe. It is inappropriate to argue that all cave and open-air sites in Levant have been discovered and completely excavated. In the future, these lacunae will undoubtedly be filled. In our view, the Levantine Upper Paleolithic was mainly autochthonous, even though anatomically modern humans played a key role in the origin of the Late Nubian industry (Derevianko, 2011).

Recently, an anatomically modern braincase was found in the late Middle Paleolithic layer of the Manot Cave, Israel, dating to 54.7 ± 5.5 ka BP (Hershkovitz, 2015). On the basis of morphological differences between this specimen and most fossils from Skhul and Qafzeh, Hershkovitz et al. believe that the Manot individual was hardly a direct descendant of those humans. At the same time, they point to a high within-group and between-group variation in these populations, so any conclusions are provisional. The chronological gap between Skhul and Qafzeh, on the one hand, and Manot, on the other, may be filled in the future when fossils later than 75 ka BP are discovered. The idea that the Manot individual was a migrant from Africa is not upheld by archaeological finds. No lithic industries of African origin dating to 70–50 ka BP have so far been found in the Levant.

The Manot individual may have resulted from hybridization, which occurred when anatomically modern humans associated with the Late Nubian Levallois Complex, had migrated to Levant from Arabia. To test this idea, DNA samples from early modern humans, Palestinian Neanderthals, the Manot individual, and the Upper Paleolithic man from Ksar Akil need to be examined.

Conclusions

1. In the Early Middle Pleistocene, about 800 ka BP, a new species, *Homo heidelbergensis/rhodesiensis*, emerged in Africa. *H. rhodesiensis* did not migrate from this continent, and gave rise to anatomically modern humans about 200–150 ka BP.

2. The first migration wave of *H. heidelbergensis* from Africa appears to have reached the Levant about 800 ka BP. The hybridization between migrants and the indigenous population in this region resulted in acculturation, which is evidenced by the materials from the site of Gesher Benot Ya'akov.

3. The second migratory wave of *H. heidelbergensis*, using the Acheulean industry, reached Europe about 600 ka BP, resulting in the emergence of a Western European Neanderthal.

4. Genetic analysis revealed that the genome of a *H. heidelbergensis* individual from Sima de los Huesos showed Denisovan affinities in mtDNA, and Neanderthal affinities in the nuclear genome. The Denisovan gene-pool also included genes related to an unknown hominin who had diverged from the common lineage about 1 Ma BP (Prüfer et al., 2014). These were likely inherited by Denisovans from *H. heidelbergensis*, who received these alleles during the migration from Africa to the Levant, by hybridization with an autochthonous Levantine population about 800 ka BP.

5. In the Levant, over the entire Middle Pleistocene, the development of two evolutionary lineages occurred on the basis of a hybrid taxon (*H. heidelbergensis* + autochthonous populations): early anatomically modern humans and Palestinian Neanderthals, showing a mosaic morphology and numerous shared features in cranial and postcranial skeleton. About 300 ka BP, some Levantine populations migrated into East Asia. About 280 ka BP, this wave of migrants reached the Altai, as evidenced by finds from the lowermost occupation layer 22 in Denisova Cave (Derevianko et al., 2003). DNA sequencing of samples from Denisova layers 22, 12, and 11 resulted in the identification of a new taxon, Denisovan, who had lived in the Altai during the Middle and Late Pleistocene. The migration wave from the Levant reached not only the Altai, but also certain areas of East and Southeast Asia. Admixture between migrants and the *Homo erectus* populations in these areas resulted in a small percentage of Denisovan and Neanderthal alleles in the modern gene-pool.

6. In the Levant, during the Middle Paleolithic, a lithic industry different from African and European industries emerged. It was associated with anatomically modern humans and the Palestinian Neanderthals, whose cultures cannot be clearly distinguished.

7. No new species of *Homo* emerged in the Levant during the Middle and Late Pleistocene. The evolution of early anatomically modern humans and the Palestinian Neanderthals on the basis of *H. heidelbergensis* did not result in speciation. We agree with Bräuer (2008, 2010; and others) that speciation (*H. heidelbergensis*) took place in Africa and Eurasia during the Middle Pleistocene, rather than with Rightmire (2001, 2009) who recognized two evolutionary lineages, *H. heidelbergensis* and *H. sapiens*, in the Middle and Late Pleistocene. In our view, the evolution of *H. sapiens*—or rather its subspecies—resulted from adaptation and gene-flow in four regions: Africa (*H. sapiens africanensis*), Europe (*H. sapiens neanderthalensis*), North and Central Asia (*H. sapiens altaiensis*), and East and Southeast Asia (*H. sapiens orientalensis*) (Derevianko, 2011).

8. Modern humans, whose remains were found in Manot Cave, appear to have emerged as a result of hybridization of the autochthonous Levantine population and modern humans associated with the Late Nubian Levallois industry.

We realize that these hypotheses need to be tested by new archaeological, anthropological, and genetic studies. DNA sequencing of Zuttiyeh, Qesem, Tabun, Skhul, Amud, Kebara, Manot, etc. might clarify a number of issues raised in this publication. Indeed, it is open to discussion, and our hypotheses may be eventually rejected. The available evidence is incomplete, and future findings may lead to substantial revision.

References

Akazawa T., Dodo S., Muhesen S., Abdul-Salam A., Abe Y., Kondo O., Mizoguchi Y. 1993
The Neanderthal remains from Dederiyeh Cave, Syria: Interim. Report. *Anthropological Science*, vol. 101 (4): 361–387.

Akazawa T., Muhesen S., Dodo Y., Kondo O., Mizoguchi Y. 1995a
Neandertal infant burial. *Nature*, vol. 377: 386–387.

Akazawa T., Muhesen S., Dodo Y., Kondo O., Mizoguchi Y., Abe Y., Nishiaki Y., Ohta S., Oguchi T., Haydal J. 1995b
Neanderthal infant burial from the Dederiyeh Cave in Syria. *Paléorient*, vol. 21: 77–86.

Akazawa T., Muhesen S., Ishidda H., Kondo O., Yoneda M., Griggo Ch. 1999
New discovery of a Neanderthal child burial from the Dederiyeh Cave in Syria. *Paléorient*, vol. 25 (2): 129–142.

Andrews P. 1984
The descent of man. *New Scientist*, vol. 102: 24–25.

Arensburg B., Bar-Yosef O., Chech M., Goldberg P., Laville H., Meignen L., Rak Y., Tchernov E., Tillier A.M., Vandermeersch B. 1985
Une sepulture néandertalienne dans la grotte de Kébara (Israel). *Comptes-Rendus de L'Académie des Sciences de Paris. Sér. D*, vol. 300: 227–230.

Arensburg B., Belfer-Cohen A. 1998
Sapiens and Neanderthals: Rethinking the Levantine Middle Palaeolithic hominids. In *Neandertals and Modern Humans in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York: Plenum Press, pp. 311–322.

Armitage S.J., Jasim S.A., Marks A.E., Parker A.G., Usik B.I., Uerpmann H.-P. 2011
The southern route "Out of Africa": Evidence for an early expansion of modern humans into Arabia. *Science*, vol. 331: 453–456.

Arsuaga J.L., Martínez I., Arnold L.J., Aranburu A., Gracia-Téllez A., Sharp W.D., Quam R.M., Falguères C., Pantoja-Pérez A., Bischoff J., Poza-Rey E., Parés J.M., Carretero J.M., Demuro M., Lorenzo C., Sala N., Martinón-Torres M., García N., Alcázar de Velasco A., Cuenca-Bescós G., Gómez-Olivencia A., Moreno D., Pablos A., Shen C.-C., Rodríguez L., Ortega A.I., García R., Bonmatí A., Bermúdez de Castro J.M., Carbonell E. 2014
Neandertal roots: Cranial and chronological evidence from Sima de los Huesos. *Science*, vol. 344: 1358–1363.

Barkai R., Gopher A., Shimelmitz R. 2005
Middle Pleistocene blade production in the Levant: An Amudian assemblage from Qesem Cave, Israel. *Eurasian Prehistory*, vol. 3: 39–74.

Barton R.N.E., Bouzouggar A., Collcutt S.N., Schwenninger J.-L., Clark-Balzan L. 2009
OSL dating of the Aterian levels at Dar es-Soltan I (Rabat, Morocco) and implications for the dispersal of modern Homo sapiens. *Quaternary Science Reviews*, vol. 28: 1914–1931.

Bar-Yosef O. 1987
Pleistocene connections between Africa and Southwest Asia: An archaeological perspective. *African Archaeological Review*, vol. 5: 29–38.

Bar-Yosef O. 1992
Middle Paleolithic human adaptation in the Mediterranean Levant. In *The Evolution and Dispersal of Modern Humans in Asia*. Tokyo: Hokusen-Sha Publ. Co., pp. 189–215.

Bar-Yosef O. 1994
The Lower Palaeolithic of the Near East. *Journal of World Prehistory*, vol. 8 (3): 211–265.

Bar-Yosef O. 1998
The chronology of the Middle Paleolithic in the Levant. In *Neandertals and Modern Humans in Western Asia*. New York: Plenum Press, pp. 39–56.

Bar-Yosef O. 2000
The Middle and Early Upper Paleolithic in Southwest Asia and neighboring regions. In *The Geography of Neanderthals and Modern Humans in Europe and the Greater Mediterranean*. Cambridge: Peabody Museum, pp. 107–156.

Bar-Yosef O. 2006
Between observation and models: An eclectic view of Middle Paleolithic archaeology. In *Transitions Before the Transition: Evolution and Stability in the Middle Paleolithic and Middle Stone Age*, E. Hovers, S.L. Kuhn (eds.). New York: Springer, pp. 305–325.

Bar-Yosef O., Callander J. 1999
The woman from Tabun: Garrod's doubts in historical perspective. *Journal of Human Evolution*, vol. 37 (6): 879–885.

Bar-Yosef O., Vandermeersch B., Arensburg B., Belfer-Cohen A., Goldberg P., Laville H., Meignen L., Rak Y., Speth J.D., Tchernov E., Tillier A.M., Weiner S. 1992

The excavations in Kebara cave, Mt. Carmel. *Anthropology*, vol. 33 (5): 497–550.

Belmaker M., Tchernov E., Condemi S., Bar-Yosef O. 2002

New evidence for hominid presence in the Lower Pleistocene of the Southern Levant. *Journal of Human Evolution*, vol. 43: 43–50.

Ben-Dor M., Gopher A., Hershkovitz I., Barkai R. 2011

Man the fat hunter: The demise of *Homo erectus* and the emergence of a new hominin lineage in the Middle Pleistocene (ca. 400 kyr) Levant. *PloSone*, vol. 6. URL: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0028689

Boëda É. 1988

Le concept Levallois et l'evaluation de son champ d'application. In *L'homme de Néanderthal*. Vol. 4: La Technique, M. Otte (ed.). Liége: Univ. de Liége, pp. 13–26. (Études et Rech. Archéol. de l'Univ. de Liège).

Boëda É. 1995

Levallois: A volumetric construction, methods, a technique. In *The Definition and Interpretation of Levallois Technology*, H.L. Dibble, O. Bar-Yosef (eds.). Madison: Prehistory Press, pp. 41–68. (Monogr. in World Archaeol.; No. 23).

Bräuer G. 1984

Präsapiens-Hypothese oder afro-europäische Sapiens-Hypothese? *Zeitschrift für Morphologie und Anthropologie*, Bd. 75 (1): 1–25.

Bräuer G. 2008

The origin of modern anatomy: By speciation or intraspectic evolution? *Evolutionary Anthropology*, vol. 12: 22–37.

Bräuer G. 2010

The Out-of-Africa model for modern human origins: Basics and current perspectives. Where did we come from? In *Current Views on Human Evolution*. Ljubljana: Univ. of Ljubljana, pp. 127–157.

Bräuer G. 2012

Middle Pleistocene diversity in Africa and the origin of modern humans. In *Modern Origins: A North African Perspective*, J. Hublin, S.P. McPherron (eds.). [s.l.]: Springer, pp. 221–240. (Vertebrate Paleobiol. and Paleoanthropol.).

Copeland L. 1975

The Middle and Upper Palaeolithic in Lebanon and Syria in the light of recent research. In *Problems in Prehistory: North Africa and the Levant*, F. Wendorf, A. Close (eds.). Dallas: Southern Methodist Univ. Press, pp. 317–350.

Copeland L. 1978

The Middle Palaeolithic of Adlun and Ras el Kelb (Lebanon): First results from a study of the flint industries. *Paléorient*, vol. 4: 33–57.

Copeland L. 2000

Forty-Six Emireh points from the Lebanon in the context of the Middle to Upper Paleolithic transition in the Levant. *Paléorient*, vol. 26: 73–92.

Crassard R., Hilbert Y.H. 2013

A Nubian complex site from Central Arabia: Implications for Levallois taxonomy and human dispersals during the Upper Pleistocene. *PloSone*, No. 8 (7). URL: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0069221

Crew H.L. 1975

An evaluation of the relationship between the Mousterian complexes of the Eastern Mediterranean: A technological perspective. In *Problems in Prehistory: North Africa and the Levant.* Dallas: Univ. Press, pp. 427–437.

Derevianko A.P. 2001

The Middle to Upper Palaeolithic transition in the Altai. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 3: 70–103.

Derevianko A.P. 2011

Verkhniy paleolit v Afrike i Evrazii i formirovaniye cheloveka sovremennogo anatomicheskogo tipa. Novosibirsk: Izd. IAE SO RAN.

Derevianko A.P. 2015

Blade and microblade industries in Northern, Eastern, and Central Asia. Pt. 1: African origin and spread to the Near East. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 43 (2): 3–22.

Derevianko A.P. 2016a

Levantine Middle Pleistocene blade industries. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 44 (1): 3–26.

Derevianko A.P. 2016b

Oldowan or pebble-flake industry? Levantine Mousterian or Levantine Middle Paleolithic? *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 44 (2): 3–18.

Derevianko A.P., Shunkov M.V., Agadzhanyan A.K., Baryshnikov G.F., Ulyanov V.A., Kulik N.A., Postnov A.V., Anoykin A.A. 2003

Prirodnaya sreda i chelovek v paleolite Gornogo Altaya. Usloviya obitaniya v okrestnostyah Denisovoi peshchery. Novosibirsk: Izd. IAE SO RAN.

D'Errico F.C., Henshilwood Ch., Vanhaeren M., Van Niekerk K. 2005

Nassarius kraussianus shell beads from Blombos Cave: Evidence for symbolic behavior in the Middle Stone Age. *Journal of Human Evolution*, vol. 48: 3–24.

Drake N.A., Breeze P., Parker A.G. 2013

Paleoclimate in the Saharan and Arabian deserts during the Middle Paleolithic and the potential for hominin dispersals. *Quaternary International*, vol. 300: 48–61.

Feibel C.S. 2004

Quaternary lake margins of the Levant Rift Valley. In *Human Paleoecology in the Levantine Corridor*. Oxford: Oxbow Books, pp. 21–36.

Freidline S.E., Gunz P., Janković I., Harvati K., Hublin J.-J. 2012

A comprehensive morphometric analysis of the frontal and zygomatic bone of the Zuttiyeh fossil from Israel. *Journal of Human Evolution*, vol. 62: 225–241.

Frumkin A., Bar-Yosef O., Schwarcz H.P. 2011

Possible paleohydrologie and paleoclimatic effects on hominin migration and occupation of the Levantine Middle Paleolithic. *Journal of Human Evolution*, vol. 60: 437–451.

Garrod D.A.E. 1962

The Middle Paleolithic of the Near East and the problem of Mount Carmel Man. *Journal of the Royal Anthropological Institute*, vol. 92: 232–251.

Gopher A., Barkai R., Shimelmitz R., Khalaly M., Lemorini C., Hershkovitz I., Stiner R. 2005

Qesem Cave an Amudian site in Central Israel. *Journal of the Israel Prehistoric Society*, vol. 35: 69–92.

Goren-Inbar N. 1992
The Acheulian site of Gesher Benot Ya'aqov: An African or Asian entity? In *The Evolution and Dispersal of Modern Humans in Asia*. Tokyo: Hokusen-Sha, pp. 67–82.

Goren-Inbar N. 2011
Behavioral and cultural origins of Neanderthals: A Levantine perspective. In *Continuity and Discontinuity in Peopling of Europe: One Hundred Fifty Years of Neanderthal Study*. [s.l.]: Springer, pp. 89–100. (Vertebrate Paleobiol. and Paleoanthropol.).

Goren-Inbar N., Belfer-Cohen A. 1998
The technological abilities of the Levantine Mousterians: Cultural and mental capacities. In *Neandertals and Modern Humans in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York: Plenum Press, pp. 205–222.

Grün R., Stringer Ch. 1991
Electron spin resonance dating and the evolution of modern humans. *Archaeometry*, No. 33: 231–248.

Grün R., Stringer Ch. 2000
Tabun revisited: Revised ESR chronology and new ESR and U-series analyses of dental material from Tabun CI. *Journal of Human Evolution*, vol. 39 (6): 601–612.

Grün R., Stringer Ch., McDermott F., Nathan R., Porat N., Robertson S., Taylor L., Mortimer G., Eggins S., McCulloch M. 2005
U-series and ESR analyses of bones and teeth relating to the human burials from Skhul. *Journal of Human Evolution*, vol. 49: 316–334.

Henshilwood Ch., D'Errico F., Marean C.W., Milo R.G., Yates R. 2001
An early bone tool industry from the Middle Stone Age at Blombos Cave, South Africa: Implications for the origins of modern human behavior, symbolism and language. *Journal of Human Evolution*, vol. 41 (6): 631–678.

Hershkovitz I., Smith P., Sarig R., Quam R., Rodriguez L., Garcia R., Arsuaga J.L., Barkai R., Gopher A. 2011
Middle Pleistocene dental remains from Qesem Cave (Israel). *American Journal of Physical Anthropology*, vol. 144 (4): 575–592.

Hershkovitz I., Marder O., Ayalon A., Bar-Matthews M., Yasur G., Boaretto E., Caracuta V., Alex B., Frumkin A., Goder-Goldberger M., Gunz Ph., Holloway R.L., Latimer B., Lavi R., Matthews A., Slon V., Bar-Yosef Mayer D., Berna F., Bar-Oz G., Yeshurun R., May H., Hans M.G., Weber G.W., Barzilai O. 2015
Levantine cranium from Manot Cave (Israel) foreshadows the first European modern humans. *Nature*, vol. 520: 216–219.

Hershkovitz I., Zaidner Y., Weinstein-Evron M. 2013 (in prep.)
Early Middle Paleolithic Human Remains from Misliya Cave (Israel) and the Quest for Early Anatomical Modern Humans.

Hovers E. 2006
Neandertals and modern humans in the Middle Paleolithic of the Levant: What kind of interaction? In *When Neanderthals and Moderns Met*. Tübingen: Kerns Verl., pp. 65–86.

Hovers E., Belfer-Cohen A. 2013
On variability and complexity: Lessons from the Levantine Middle Paleolithic record. *Current Anthropology*, Dec., vol. 54 (Suppl. 8): 337–357.

Howell F.C. 1958
Upper Pleistocene men of the Southwest Asian Mousterian. In *Hundert Jahre Neanderthaler*, G.H.R. von Koenigswald (ed.). Utrecht: Utrecht kemink en zoon, pp. 185–198.

Howell F.C. 1999
Paleo-demes, species clades, and extinctions in the Pleistocene hominin record. *Journal of Anthropological Research*, vol. 55: 191–243.

Hublin J.J. 1998
Climatic changes, paleogeography, and the evolution of the Neanderthals. In *Neandertals and modern humans in Western Asia*. New York: Plenum Press, pp. 293–310.

Hublin J.-J. 2001
Northwestern African Middle Pleistocene hominids and their bearing on the emergence of Homo sapiens. In *Human Roots. Africa and Asia in the Middle Pleistocene*, L. Barham, K. Robson-Brown (eds.). Bristol: Western Academic and Specialist Press, pp. 99–121.

Hublin J.-J. 2009
Out of Africa: Modern human origins special feature: The origin of Neanderthals. *Proceedings of the National Academy of Sciences*, vol. 106: 16022–16027.

Jacobs Z., Wintle A.G., Duller G.A.T. 2003
Optical dating of dune Sand from Blombos Cave, South Africa: 1 – multiple grain-data. *Journal of Human Evolution*, vol. 44: 599–625.

Jelinek A.J. 1975
A preliminary report on some Lower and Middle Palaeolithic industries from the Tabun Cave (Mount Carmel), Israel. In *Problem Prehistory North Africa and the Levant*. Dallas: SMU Press, pp. 297–315.

Jelinek A.J. 1981
The Middle Palaeolithic in the Southern Levant from the Perspective of the Tabun Cave. In *Préhistoire du Levant*. Paris: Centre Nat. de la Recherche Sci. Press, pp. 265–280.

Jelinek A.J. 1982a
The Middle Palaeolithic in the Southern Levant, with comments on the appearance of Modern *Homo sapiens*. In *The Transitions from Lower to Middle Palaeolithic and the Origin of Modern Man*, A. Ronen (ed.). Oxford: BAR, pp. 57–104. (BAR, Intern. Ser.; No. 151).

Jelinek A.J. 1982b
The Tabun Cave and Paleolithic man in the Levant. *Science*, vol. 216: 1369–1375.

Jelinek A.J. 1992
Problems in the chronology of the Middle Paleolithic and the first appearance of early modern *Homo sapiens* in Southwest Asia. In *The Evolution and Dispersal of Modern Humans in Asia*. Tokyo: Hokusen-Sha, pp. 253–275.

Johanson D., Blake B. 1996
From Lucy to Language. New York: Siemens and Schuster.

Johnson C.R., McBrearty S.C. 2010
500 000 year old blades from the Kapthurin Formation, Kenya. *Journal of Human Evolution*, vol. 58 (2): 193–200.

Kaufman D. 2002
Mind the gap: Questions of continuity and the evolution of anatomically modern humans as seen from the Levant.

Archaeology, Ethnology and Anthropology of Eurasia, No. 4: 53–61.

Korobkov I.I. 1978

Paleolit Vostochnogo Sredizemnomorya. In *Paleolit mira*. Vol. 2: Paleolit Blizhnego i Srednego Vostoka. Leningrad: Nauka, pp. 9–195.

Kramer A., Crummett T.L., Wolpoff M.H. 2001

Out of Africa and into the Levant: Replacement in Western Asia? *Quaternary International*, vol. 75 (1): 51–63.

Lari M., Divincenzo F., Borsato A., Ghirotto S., Micheli M., Balsamo C., Collina C., De Bellis G., Frisia S., Giacobini G., Gigli E., Hellstrom J.C., Lannino A., Modi A., Pietrelli A., Pilli E., Profico A., Ramirez O., Rizzi E., Vai S., Venturo D., Piperno M., Lalueza-Fox C., Barbujani G., Caramelli D., Manzi G. 2015

The Neanderthal in the karst: First dating, morphometric, and paleogenetic data on the fossil skeleton from Altamura (Italy). *Journal of Human Evolution*, vol. 82: 88–94.

Lietava J. 1992

Medical plants in a Middle Paleolithic grave Shanidar IV. *Journal of Ethnopharmacology*, vol. 35: 263–266.

Marks A.E. 1983

The Middle to Upper Paleolithic transition in the Levant. In *Advances in World Archaeology*, F. Wendorf, A.E. Close (eds.), vol. 2. New York: Academic Press, pp. 51–98.

Marks A.E. 1992

Typological variability in the Levantine Middle Paleolithic. In *The Middle Paleolithic: Adaptation, Behavior, and Variability*, vol. 72. Philadelphia: The Univ. of Pennsylvania, pp. 127–142.

Marks A.E., Monigal K. 1995

Modeling the production of Elongated Blanks from the Early Levantine Mousterian at Rosh Ein Mor. In *The Definition and Interpretation of Levallois Technology*, H. Dibble, O. Bar-Yosef (eds.). Madison: Prehistory Press, pp. 267–278.

Marks A.E., Volkman P. 1986

The Mousterian of Ksar-Akil: levels XXVIA through XXIIIB. *Paléorient*, vol. 12/1: 5–20.

Mbua E., Bräuer G. 2012

Patterns of Middle Pleistocene hominin evolution in Africa and the emergence of modern humans. In *African Genesis: Perspectives on Hominin Evolution*. Cambridge: Cambridge Univ. Press, pp. 394–422.

McBrearty S. 1999

The archaeology of the Kapthurin Formation. In *Late Cenozoic Environments and Hominid Evolution: a Tribute to Bill Bishop*, P. Andrews, P. Banham (eds.). London: Geol. Soc., pp. 143–156.

McBrearty S., Bishop L.C., Kingston J.D. 1996

Variability in traces of Middle Pleistocene hominid behaviour in the Kapthurin Formation, Baringo, Kenya. *Journal of Human Evolution*, vol. 30 (6): 563–580.

McBrearty S., Brooks A. 2000

The revolution that wasn't: A new interpretation of the origin of modern human behavior. *Journal of Human Evolution*, vol. 39 (5): 453–563.

McBurney C.B.M. 1967

The Haua Fteah (Cyrenaica) and the Stone Age of the South-East Mediterranean. Cambridge: Cambridge Univ. Press.

McClure H. 1994

A new Arabian stone tool assemblage and notes on the Aterian industry of North Africa. *Arabian Archaeology and Epigraphy*, vol. 5 (1): 1–16.

McCown T.D. 1934

The oldest complete skeletons of man. *Bulletin of the American School of Prehistoric Research*, vol. 10: 12–19.

McCown T.D., Keith A. 1939

The Stone Age of Mount Carmel. Vol. II: The Fossil Human Remains from the Levalloiso-Mousterian. Oxford: The Clarendon Press.

McDermott F., Grün R., Stringer C.B., Hawkesworth C.J. 1993

Mass-spectrometre U-series dates for Israeli Neanderthal/early modern hominid sites. *Nature*, vol. 363: 252–255.

Meignen L. 1994

Le Paléolithique moyen au Proche-Orient: Le phénoméne luminaire. In *Les Industries Laminaires au Paléolithique Moyen*, S. Révillion, A. Tuffreau (eds.). Paris: Centre Nat. de la Recherche Sci., pp. 125–159.

Meignen L. 1998

Hayonim cave lithic assemblages in the context of the Near Eastern Middle Paleolithic. In *Neandertals and Modern Humans in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York, London: Plenum Press, pp. 165–180.

Meignen L. 2000

Early Middle Palaeolithic blade technology in Southwestern Asia. *Axta Anthropologica Sinica*, vol. 19: 158–168.

Meignen L., Bar-Yosef O. 1992

Middle Paleolithic variability in Kebara Cave, Mount Carmel, Israel. In *The Evolution and Dispersal of Modern Humans in Asia*, T. Akazawa, K. Aoki, T. Kimura (eds.). Tokyo: Hokusen-Sha, pp. 129–148.

Meignen L., Bar-Yozef O. 2002

The lithic industries of the Middle and Upper Paleolithic of the Levant: Continuity or break? *Archaeology, Ethnology and Anthropology of Eurasia*, No. 3: 1–21.

Meignen L., Bar-Yozef O. 2005

Kamennye industrii srednego i verkhnego paleolita Levanta: posledovatelnost ili prervannaya liniya razvitiya? Perekhod ot srednego k pozdnemu paleolitu v Evrazii: Gipotezy i fakty. Novosibirsk: Izd. IAE SO RAN, pp. 166–175.

Mercier N., Valladas H. 2003

Reassessment of TL age estimates of burnt flints from the Paleolithic site of Tabun Cave, Israel. *Journal of Human Evolution*, vol. 45 (5): 401–409.

Mercier N., Valladas H., Bar-Yosef O., Vandermeersch B., Stringer C., Joron J.-L. 1993

Thermoluminescence date for the Mousterian burial site of es-Skhul, Mt. Carmel. *Journal of Archaeological Science*, No. 20: 169–174.

Mercier N., Valladas H., Froget L., Joron J.-L., Vermeersch P.M., Van Peer P., Moeyersons J. 1999

Thermoluminescence dating of a Middle Palaeolithic occupation at Sodmein Cave, Red Sea Mountains (Egypt). *Journal of Archaeological Science*, vol. 26 (11): 1339–1345.

Meyer M., Fu Q., Aximu-Petri A., Clocke I., Nickil B., Arsuaga J.-L., Martinez I., Gracia A.,

Bermudez de Castro J.M., Carbonell E., Pääbo S. 2014
A mitochondrial genome sequence of a hominin from Sima de Los Huesos. *Nature*, vol. 505: 403–406.

Meyer M., Arsuaga J.-L., de Filippo C., Nagel S., Aximu-Petri A., Nickel B., Martinez I., Gracia A., Bermudez de Castro J.M., Carbonell E., Viola B., Kelso J., Prüfer K., Pääbo S. 2016
Nuclear DNA sequences from the Middle Pleistocene Sima de los Huesos hominins. *Nature*, vol. 531: 504–507.

Monigal K. 2001
Lower and Middle Paleolithic blade industries and the dawn of the Upper Paleolithic in the Levant. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 1: 11–24.

Neuville R. 1951
Le Paléolithique et le Mésolithique du désert de Judée, vol. 24. Paris: Masson. (Archives Inst. Paléontol. Humaine).

Ohnuma K. 1992
The significance of Layer B (Square 8–19) of the Amud Cave (Israel) in the Levantine Levalloiso-Mousterian: A technology study. In *The Evolution and Dispersal of Modern Humans in Asia*. Tokyo: Hokusen-Sha Publ., pp. 83–106.

Pääbo S. 2014
Neanderthal Man: In Search of Lost Genoms. New York: Basic Books.

Porat N., Schwarcz H.P., Valladas H., Bar-Yosef O., Vandermeersch B. 1994
Electron spin resonance dating of burned flint from Kebara Cave Israel. *Geoarchaeology*, vol. 9: 393–407.

Prüfer K., Racimo F., Patterson N., Jay F., Sankararaman S., Sawyer S., Heinze A., Renaud G., Sudmant P.H., de Filippo C., Li H., Mallick S., Dannemann M., Fu Q., Kircher M., Kuhlwilm M., Lachmann M., Meyer M., Ongyerth M., Siebauer M., Theunert C., Tandon A., Moorjani P., Pickrell J., Mullikin J.C., Vohr S.H., Green R.E., Hellmann I., Johnson P.L., Blanche H., Cann H., Kitzman J.O., Shendure J., Eichler E.E., Lein E.S., Bakken T.E., Golovanova L.V., Doronichev V.B., Shunkov M.V., Derevianko A.P., Viola B., Slatkin M., Reich D., Kelso J., Pääbo S. 2014
The complete genome sequence of a Neanderthal from the Altai Mountains. *Nature*, vol. 505 (7481): 43–49.

Quam R.M., Smith F.H. 1998
A reassessment of the Tabun C 2 mandible. In *Neandertals and Modern Human in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York: Plenum Press, pp. 405–421.

Rak Y. 1998
Does any Mousterian cave present evidence of two hominid species? In *Neandertals and Modern Human in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York: Plenum Press, pp. 353–366.

Rak Y., Kimbel W.H., Hovers E. 1994
A Neanderthal infant from Amud Cave, Israel. *Journal of Human Evolution*, vol. 26: 313–324.

Rightmire G.P. 1996
The human cranium from Bodo, Ethiopia: Evidence for speciation in the Middle Pleistocene? *Journal of Human Evolution*, vol. 31: 251–260.

Rightmire G.P. 1998
Human evolution in the Middle Pleistocene: The role of *Homo heidelbergensis* Evolutionary. *Anthropology*, vol. 6: 218–227.

Rightmire G.P. 2001
Morphological diversity in Middle Pleistocene Homo. In *Humanity from African Naissance to Coming Millenia*. Florence: Florence Univ. Press, pp. 135–140.

Rightmire G.P. 2009
Middle and later Pleistocene hominins in Africa and Southwest Asia. *Proceedings of the National Academy of Sciences*, vol. 106 (38): 16046–16050.

Ronen A. 1976
The Skhul burials: An archaeological review. In *Colloque XII: Les Sépultures anderthaliennes: IX Congr*. Nice: pp. 27–40.

Ronen A. 2012
The oldest burials and their significance. In *African Genesis: Perspectives on Hominin Evolution*. Cambridge: Cambridge Univ. Press, pp. 554–570.

Ronen A., Gisis I., Tchernikov I. 2011
The Mugharan Tradition reconsidered. In *The Lower and Middle Paleolithic in the Middle East and Neighboring Regions*, J.-M. Le Tensorer, R. Jagher, M. Otte (eds.). Liège: Univ. de Liège, pp. 59–66. (Études et Rech. Archéol. de l'Univ. de Liège; No. 126).

Rose J.I., Marks A.E. 2014
"Out of Arabia" and the Middle-Upper Palaeolithic transition in the Southern Levant. *Quartär*, vol. 61: 49–85.

Sarel J., Ronen A. 2003
The Middle/Upper Paleolithic transition in Northern and Southern Israel: A technological comparison. In *More Than Meets the Eye*, A.N. Goring-Morris, A. Belfer-Cohen (eds.). Oxford: Oxbow Books, pp. 68–79.

Schwarcz H.P., Simpson J.J., Stringer C.B. 1998
Neanderthal skeleton from Tabun: U-series data by gamma-ray spectrometry. *Journal of Human Evolution*, vol. 35: 635–645.

Schwartz J.H., Tattersall I. 2005
Fossils attributed to genus *Homo*: Some general notes. *The Human Fossil Record: Craniodental Morphology of Genus Homo (Africa and Asia)*, vol. 2: 587–603.

Shea J.J. 2001
Modern human origins and Neanderthal extinction: New evidence from the East Mediterranean Levant. *Athena Review*, No. 4: 21–32.

Shea J.J. 2003
Neandertals, competition, and the origin of modern human behavior in the Levant. *Evolutionary Anthropology*, vol. 12: 173–187.

Shea J.J. 2006
The origins of lithic projectile point technology: Evidence from Africa, the Levant, and Europe. *Journal of Archaeological Science*, vol. 33: 823–846.

Shea J.J. 2007
Behavioral differences between Middle and Upper Paleolithic Homo sapiens in the East Mediterranean Levant: The roles of intraspecific competition and dispersal from Africa. *Journal of Anthropological Research*, vol. 64: 449–488.

Shea J.J. 2008
Transitions or turnovers? Climatically-forced extinctions of Homo sapiens and Neanderthals in the east Mediterranean Levant. *Quaternary Science Reviews*, vol. 27: 2253–2270.

Shimelmitz R., Barkai R., Gopher A. 2011
Systematic blade production at late Lower Paleolithic (400–200 kyr) Qesem Cave, Israel. *Journal of Human Evolution*, vol. 61: 458–479.

Shimelmitz R., Barkai R., Gopher A. 2015
Regional variability in late Lower Paleolithic Amudian blade technology: Analyzing new data from Qesem, Tabun and Yabrud. *Quaternary International*, vol. 398: 118–128.

Shimelmitz R., Kuhn S.L. 2013
Early Mousterian Levallois Technology in Unit IX of Tabun Cave. *PaleoAnthropology*: 1–27. URL: http://www.paleoanthro.org/media/journal/content/PA20130001.pdf

Singer R., Wymer J. 1982
The Middle Stone Age at Klasies River Mouth in South Africa. Chicago: Chicago Univ. Press, pp. 194–199.

Solecki R.S. 1953
The Shanidar Cave sounding, 1953 season, with notes concerning the discovery of the first Paleolithic skeleton in Iraq. *Sumer*, vol. 9 (1): 229–232.

Solecki R.S. 1960
Three adult Neanderthal skeletons from Shanidar Cave, Northern Iraq. *Annual Report of the Smithsonian Institution for 1959*: 603–635.

Solecki R.S. 1975
Shanidar IV, a Neanderthal flower burial in northern Iraq. *Science*, vol. 190: 880–881.

Stefan V.H., Trinkaus E. 1998
Discrete trait and dental morphometric affinities of the Tabun 2 mandible. *Journal of Human Evolution*, vol. 34: 443–468.

Stringer C.B. 1992
Replacement, continuity and the origin of *Homo sapiens*. In *Continuity of Replacement? Controversies in Homo sapiens Evolution*, G. Brauer, F.H. Smith (eds.). Rotterdam: A.A. Balkema, pp. 9–24.

Stringer C.B. 1998
Chronological and biogeographic perspectives on later human evolution. In *Neandertals and Modern Humans in Western Asia*, T. Akazawa, K. Aoki, O. Bar-Yosef (eds.). New York: Plenum Press, pp. 29–37.

Stringer C.B. 2012
The Status of *Homo heidelbergensis*. *Evolutionary Anthropology*, vol. 21 (3): 101–107.

Stringer C.B., Andrews P. 1988
Genetic and fossil evidence for the evidence of modern humans. *Science*, vol. 239: 1263–1268.

Stringer C.B., Grün R., Schwarcz H.P., Goldberg P. 1989
ESR dates for the hominid burial site of es-Skhul in Israel. *Nature*, vol. 338: 756–758.

Tchernov E. 1987
The age of Ubeidiya Formation, an Early Pleistocene hominid site in the Jordan Valley, Israel. *Israel Journal of Earth Sciences*, vol. 36 (1): 3–30.

Tchernov E. 1992
Biochronology, paleoecology, and dispersal events of hominids in the Southern Levant. In *The Evolution and Dispersal of Modern Humans in Asia*, T. Akazawa, K. Aoki, T. Kimura (eds.). Tokyo: Hokusen-Sha, pp. 149–188.

The Amud Man and His Cave Site. 1970
H. Suzuki, P. Takai (eds.). Tokyo: Academic Press.

The Stone Age of Mount Carmel. 1937
D.A.E. Garrod, D.M.A. Bate (eds.). Vol. 1: Excavations at the Wady el-Mughara. Oxford: Clarendon Press, UK, pp. 137–140.

Tobias P.V. 1966
A re-examination of the Kedong Brubus mandible. *Zoologische Mededelingen*, vol. 41: 307–320.

Trinkaus E. 1983
The Shanidar Neandertals. New York: Academic Press.

Trinkaus E. 1987
The Neanderthal face: Evolutionary and functional perspectives on a recent hominid face. *Journal of Human Evolution*, vol. 16: 429–443.

Trinkaus E. 1993
Comment. *Current Anthropology*, vol. 34: 620–622.

Trinkaus E. 1995
Near Eastern late archaic humans. *Paleorient*, vol. 21: 9–23.

Tryon C.A., McBrearty S. 2002
Tephrostratigraphy and the Acheulian to Middle Stone Age transition in the Kapthurin Formation, Baringo, Kenya. *Journal of Human Evolution*, vol. 42 (1/2): 211–235.

Tryon C.A., McBrearty S. 2006
Thermostratigraphy of the Bedded Tuff Member (Kapthurin Formation, Kenya) and the nature of archaeological change in the later middle Pleistocene. *Quaternary Research*, vol. 65: 492–507.

Usik V.I., Rose J.I., Hilbert Y.H., Van Peer P., Marks A.E. 2013
Nubian Complex reduction strategies in Dhofar, southern Oman. *Quaternary International*, vol. 300: 244–266.

Valladas H., Mercier N., Hershkovitz I., Zaidner Y., Tsatskin A., Yeshurun R., Vialettes L., Joron J.-L., Reyss J.-L., Weinstein-Evron M. 2013
Dating the Lower to Middle Paleolithic transition in the Levant: A view from Misliya Cave, Mount Carmel, Israel. *Journal of Human Evolution*, vol. 655 (5): 585–593.

Vallois H. 1962
La dent humaine levalloiso-moustérienne de Ras-el-Kelb, Liban. *Folia Primatologia*, Basel, vol. 1: 155–162.

Vandermeersch B. 1969
Decouverte d'un objet en ocre avec traces d`utilization dans le Moustérien de Qafzeh (Israel). *Bulletin de la Societe Prehistorique Francaise*, vol. 66: 57–80.

Vandermeersch B. 1981
Les Hommes Fossiles de Qafsech (Israel). Paris: Centre Nat. de la Recherche Sci.

Vandermeersch B. 1992
The Near Eastern hominids and the origins of modern humans in Eurasia. In *Evolution and Dispersal of Modern Humans in Asia*, T. Akazawa, K. Aoki, T. Kimura (eds.). Tokyo: Hokusen-Sha, pp. 29–38.

Vandermeersch B. 1997
The Near East and Europe: Continuity or discontinuity? In *Conceptual Issues in Modern Human Origins Research*, G.A. Clark, C.M. Willermet (eds.). New York: Aldine de Gruyter, pp. 107–116.

Van Peer P. 1998
The Nile corridor and the out-of-Africa model: An examination of the archaeological record. *Current Anthropology*, vol. 39: 115–140.

Van Peer P., Vermeersch P.M., Paulissen E. 2010

Chert Quarrying, Lithic Technology and a Modern Human Burial at the Palaeolithic Site of Taramsa 1, Upper Egypt. Leuven: Univ. Press.

Vasiliev S.V. 2006

Neandertaltsy i neandertaloidnost. In *Doistoricheskiy chelovek. Biologicheskiye i sotscialnye aspekty*. Moscow: Orgservis, pp. 121–170.

Vermeersch P.M., Paulissen E., Stokes S., Charlier C., Van Peer P., Stringer C., Lindsay W. 1998

A Middle Palaeolithic burial of a modern human at Taramsa Hill, Egypt. *Antiquity*, vol. 72: 475–484.

Watanabe H. 1968

Flake production in a transitional industry from the Amud Cave: A statistical approach to Paleolithic typology. In *La préhistoire*: *Problèmes* et tendances, F. Bordes (ed.). Paris: Centre Nat. de la Recherche Sci., pp. 499–509.

Weinstein-Evron M., Bar-Oz G., Tsatskin A., Druck D., Porat N., Hershkovitz I. **2015**

Introducing Misliya Cave, Mount Carmel, Israel: A new continuous Lower: Middle Paleolithic sequence in the Levant. *Eurasian Préhistory*, vol. 1: 31–55.

Wrinn P.J., Rink W.J. 2003

ESR dating of tooth enamel African levels at Mugharet et'Alya (Tangier, Morocco). *Journal of Archaeological Science*, vol. 30: 127–133.

Wurz S. 2005

Exploring and quantifying technological differences between the MSA I, MSA II and Howieson's Poort at Klasies River. In *From Tools to Symbols: From Early Hominids to Modern Humans*. Johannesburg: Witwatersrand Univ. Press, pp. 418–440.

Zaidner V., Weinstein-Evron M. 2012

Making a point: the Early Middle Paleolithic tool assemblage of Misliya Cave, Mount Carmel, Israel. *Before Farming*, vol. 4: 1–23.

Zubov A.A. 2004

Paleoantropologicheskaya rodoslovnaya cheloveka. Moscow: Inst. etnologii i antropologii RAN.

Zviely D., Galili E., Ronen A., Salamon A., Ben-Avraham Z. 2009

Reevaluating the tectonic uplift of western Mount Carmel, Israel, since the middle Pleistocene. *Quaternary Research*, vol. 71 (2): 239–245.

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Faunal Remains from the Early Complexes of the Sagan-Zaba II Multilayered Habitation Site (9120–7880 cal BP) in the Cis-Baikal: Planigraphy, Subsistence Patterns, and Seasonality*

This article is the first publication to analyze faunal remains from early complexes (layers VII and VI) at the multilayered settlement of Sagan-Zaba II, situated on the western shore of Lake Baikal. We discuss species composition of fauna from the site, as well as associated radiocarbon dates, age and sex determinations, spatial distribution, and their overall selection as it relates to site seasonality. We address the previously described potential offset between uncalibrated dates from remains of ungulates and Baikal seals at the site, relating to the problem of "old" carbon in Lake Baikal. For layer VII, this offset is 682 years on average, and for layer VI it is 509 years. Taking the offset from Baikal seal bones into account, layers VII and VI now appear to date to the period between 9120 and 7880 cal BP. An analysis of faunal materials from the early complexes of Sagan-Zaba II indicates that inhabitants of this site hunted Baikal seals, ungulates, and other mammals, as well as birds and fish, demonstrating a wide use of natural resources. Most likely, sites featured short-term, seasonal occupations, as indicated by the distribution of hearths and other materials, the thickness of hearth-features, and the absence of specialized production areas. The results of an analysis of dentine layers from thin-sections of Baikal seal teeth, and also the presence of bones from fauna that are only available during the warm months of the year in the Cis-Baikal region, are consistent with a model of spring and summer site use.

Keywords: *Zooarchaeology, Cis-Baikal, Holocene, subsistence, radiocarbon dating.*

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Introduction

The multilayered habitation site Sagan-Zaba II is represented by several complexes characteristic of Cis-Baikal ancient cultures during the Holocene. The period over which the site was occupied has been determined on the basis of extensive radiocarbon dating, which indicates site use from ~9000 to 900 cal BP (Nomokonova et al., 2013). Various archaeological and faunal materials from the site allow tracing of the special features of the Olkhon regional subsistence development in different chronological intervals. Archaeological complexes of a number of cultural layers have already been introduced into scientific use (Dolganov et al., 2011, 2013; Goriunova et al., 2012; Novikov, Goriunova, Weber, 2014; Nomokonova et al., 2010). However, numerous faunal remains obtained in the course of excavations in the northeastern part of the bay, and also the subsistence aspects, were not considered earlier. This article is the first publication devoted to analysis of faunal remains from early complexes of this part of the Sagan-Zaba II site (layers VII and VI of the 2007–2008 excavation areas), including analysis of the species composition, radiocarbon dating of animal bones, planigraphy of their finding in the layers, selection of animals, and seasonality of this site.

The site is situated in the Sagan-Zaba bay, on the western shore of Lake Baikal (Fig. 1), 154 km to the northeast of Irkutsk and 13.5 km to the southeast of the Elantsy settlement (Olkhonsky District of the Irkutsk Region). It was discovered in 1972 by a team of the North Asian Expedition of the Institute of History, Philology and Philosophy of the SB USSR Academy of Sciences, headed by A.P. Okladnikov. Excavations were carried out by the same team under the supervision of A.P. Okladnikov and I.V. Aseyev in 1974–1975. Five cultural layers were distinguished (Okladnikov, 1975; Aseyev, 2003: 51). Excavations aimed at complex multidisciplinary studies of the site were resumed in 2006–2008 by the Sagan-Zaba team of the Russian-Canadian Archaeological Expedition (Irkutsk Laboratory of Archaeology and Paleoecology of the Institute of Archaeology and Ethnography SB RAS, and Department of Anthropology of the University of Alberta, Edmonton, Canada) (Goriunova, Novikov, Vorobieva et al., 2007; Goriunova, Novikov, Weber et al., 2008). The studies conducted in the northeastern part of the bay (the most promising for excavations) have resulted in 11 cultural layers being distinguished (from VII to I, taking into account that some of them are subdivided into lower and upper).

The stratigraphic sequence in the excavation area is a series of humic sandy loam soils separated by interlayers of light rubbly sandy loam and coarse deposits of proluvial and diluvial genesis (Fig. 2) (Goriunova, Novikov, Weber et al., 2008; Vorobyeva, 2010). Complexes VII and VI of the lower and upper cultural horizons are stratigraphically tied to the grayish-brown (up to brown) and dark grayish-brown layers of humic sandy loam 0.12–0.18 m thick. Their division is well defined at the front wall of the

Fig. 1. Schematic map showing location of the Sagan-Zaba II site on the shore of Lake Baikal.

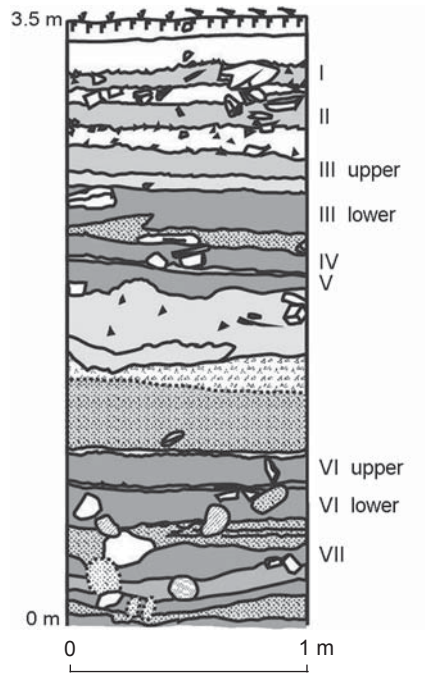

Fig. 2. Stratigraphic sequence of the northwestern wall of trench 4c (sq. 4a).

trench (depthward into abrasion scarp); near the coastal cliff, the layer's thickness reduces to 0.05 m (Fig. 3).

The technique of field studies included the unearthing of trenches layer by layer; thorough screening of the sediments from all cultural deposits through a 3 mm mesh sieve; recording of materials using an electronic theodolite by three-dimensional indicators; detailed stratigraphic study of sequences; and selection of samples for study by natural science methods.

Radiocarbon dating of animal bones

The chronology of lower and upper layers VII and VI of Sagan-Zaba II site has been determined by means of 16 radiocarbon AMS dates (Table 1), calibrated using the Calib 7.0.1 software program (Stuiver, Reimer, 1993) and using the IntCal13 database (Reimer et al., 2013). The dates have been obtained from bones of ungulates and Baikal seals selected in equal quantities from each analyzed layer, and presented on a calibrated curve at 95 % probability. In previous publications, we

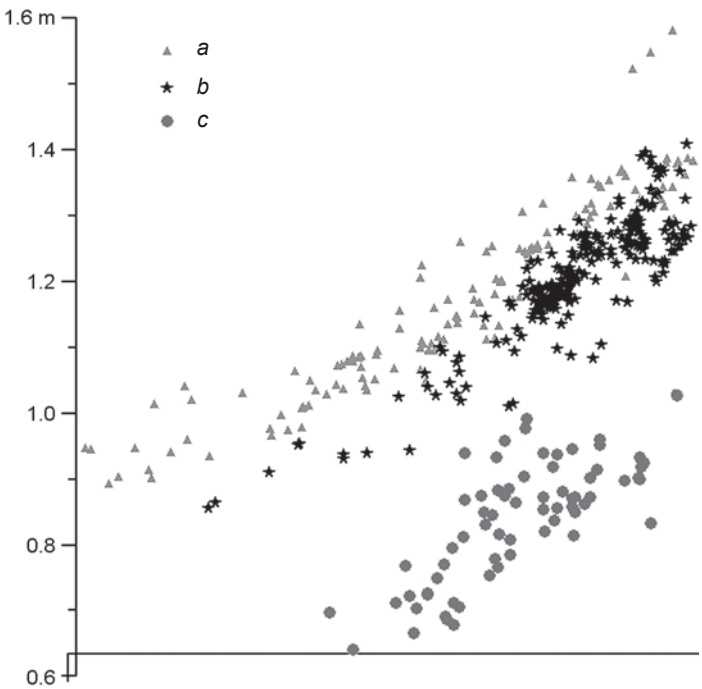

Fig. 3. Two-dimensional vertical sequence of trench 4c with the density of archaeological material found in layers VII and VI.
a – upper layer VI; *b* – lower layer VI; *c* – layer VII.

Table 1. **Results of radiocarbon dating of animal bones**

No. of sample	Taxon	^{14}C-date	Date taking "old" carbon into account	Calibrated values BP	ETI (68 % probability)
		Layer VII			
OxA22387	*Cervus elaphus*	8024 ± 40	–	9020–8730	1–257
OxA22363	*Capreolus pygargus*	8010 ± 40	–	9010–8730	
OxA22364	"	7986 ± 37	–	9000–8660	
OxA22358	Artiodactyla	7971 ± 39	–	9000–8650	
OxA22411	*Phoca sibirica*	8745 ± 45	8063 ± 45	9120–8770	1–244
OxA22419	"	8705 ± 40	8023 ± 40	9020–8720	
OxA22412	"	8680 ± 40	7998 ± 40	9010–8660	
OxA22421	"	8600 ± 40	7918 ± 40	8980–8610	
		Lower and upper layers VI			
OxA22357	Artiodactyla c.f.	7203 ± 37	–	8160–7950	1–79
OxA22390	Artiodactyla	7188 ± 36	–	8150–7940	
OxA22356	"	7179 ± 36	–	8100–7940	
OxA22374	Cervidae c.f.	7147 ± 38	–	8020–7880	
OxA20578	*Phoca sibirica*	7924 ± 40	7415 ± 40	8340–8170	1–222
OxA20580	"	7881 ± 37	7372 ± 37	8320–8050	
OxA22420	"	7865 ± 40	7356 ± 40	8310–8040	
OxA20579	"	7835 ± 37	7326 ± 37	8200–8020	

only used the results of dating the samples of ungulates, since Baikal seal bones contain "old" carbon of Lake Baikal; in view of which the radiocarbon dates obtained from them are overestimated by several centuries (for more detail, see (Nomokonova et al., 2013)). In this study, a potential offset between uncalibrated dates from bone remains of ungulates and Baikal seals is addressed. For layer VII, this offset is 682 years, and for layer VI it is 509 years. Taking the offset from Baikal seal bones into account, the cultural remains of layer VII are now dated to the period between 9120 and 8610 cal BP, and those of layer VI to the period between 8340 and 7880 cal BP (Table 1; Fig. 4).

Considering that several radiocarbon dates have been obtained for each layer, it became possible to use an additional function available in the BCAL software program (Buck, Christen, James, 1999) under the name of ETI (elapsed time intervals). It allows a rough estimate of the length of time represented by the obtained set of dates, to make an assumption about the time period to which these dates pertain and when the site could have been used. Table 1 gives such indicators calculated for the dates obtained from bones of ungulates and Baikal seals from each of the analyzed layers. These demonstrate that, probably, the time periods when these animals were used at the site are more or less equal, except for ungulates whose remains have been found in layer VI, where this indicator is smaller (up to 80 years).

Context of finding faunal remains

Faunal remains in layers VII and VI of the Sagan-Zaba II site were mainly localized as concentrations near the areas of hearths, fireplaces, and stone structures. For example, one fireplace and six stone features, occupying a considerable part of the excavated area, have been recorded in layer VII (Fig. 5). Apparently, all of them were used as hearth-constructions. These structures with oval or circular shape are either continuous or composed of separate stones. The constructions have dimensions of 0.92–0.34 × 0.71–0.28 m. The thickness of ash pits is minor. The archaeological material of layer VII was located in several concentrations in the area of hearths.

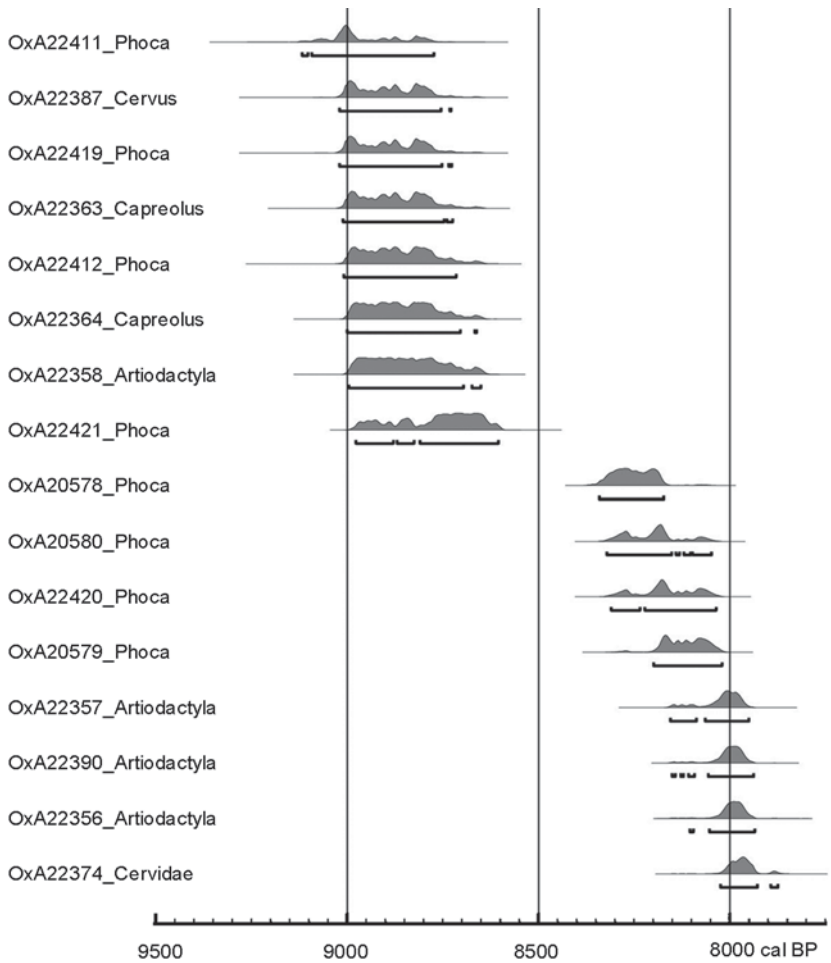

Fig. 4. Radiocarbon dates obtained from animal bones from layers VII and VI.

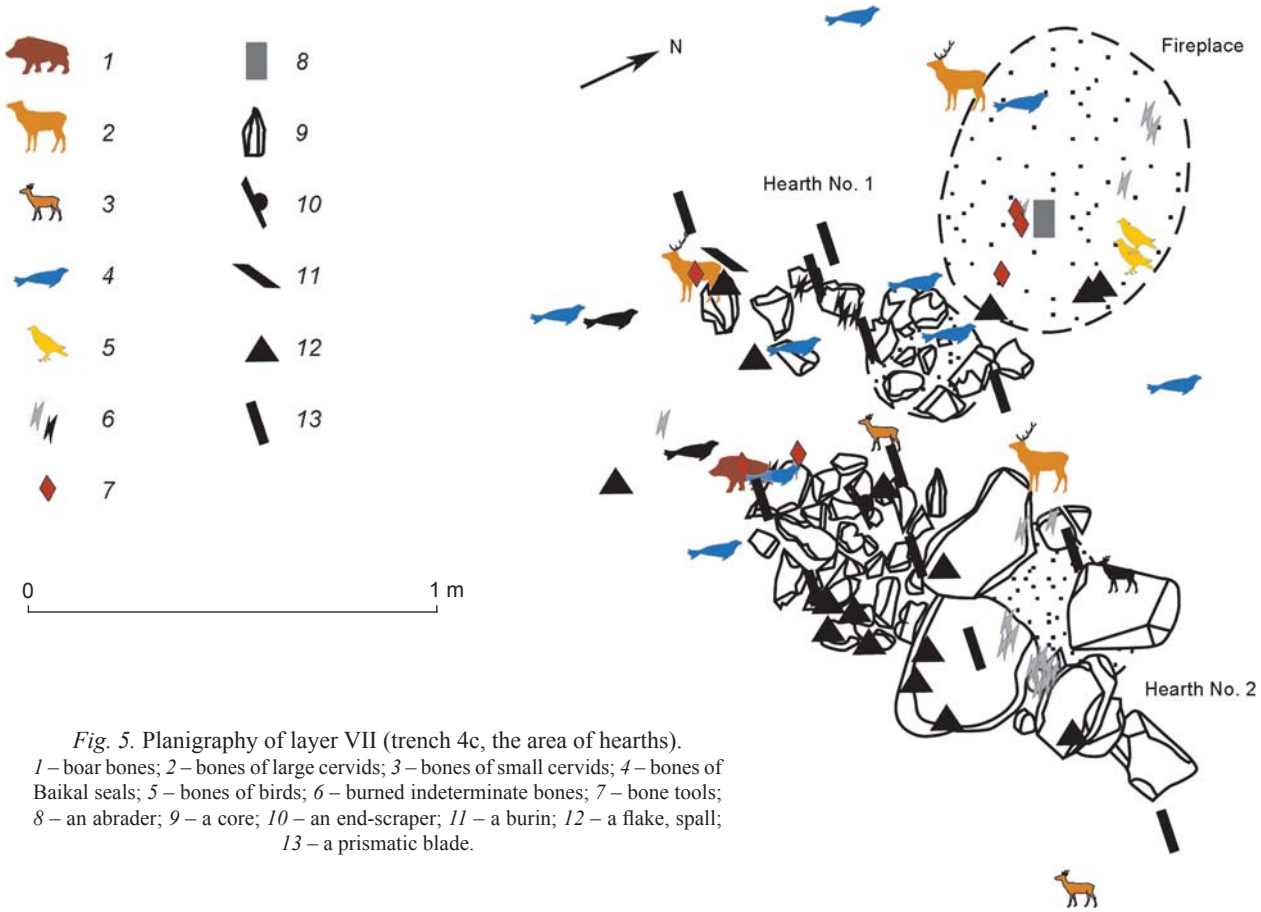

Fig. 5. Planigraphy of layer VII (trench 4c, the area of hearths).
1 – boar bones; *2* – bones of large cervids; *3* – bones of small cervids; *4* – bones of Baikal seals; *5* – bones of birds; *6* – burned indeterminate bones; *7* – bone tools; *8* – an abrader; *9* – a core; *10* – an end-scraper; *11* – a burin; *12* – a flake, spall; *13* – a prismatic blade.

These are mainly faunal remains. Together with these, stone and bone items were also present, including prismatic blades, a cutting tool, an adze, burins, a reamer, inserts and pieces of bone parts of composite tools, a harpoon, and fragments of split boar-canine (Fig. 6, *3–7*). The compositions of these concentrations make it possible to define them as domestic waste deposits.

In general, the planigraphic placement of faunal remains in lower and upper layers VI confirms the context of the finds near hearths and stone structures. In contrast to the previous layer, pottery fragments (from more than 17 vessels) have been recorded in these complexes. The archaeological material of lower layer VI was concentrated in three accumulations, similar in their composition and typological set of goods (Goriunova et al., 2012). All of them were grouped near the hearth (eastward and westward of it). The semi-circular hearth stone feature has an oval shape, 1.1 × 0.8 m in size. The thickness of the ash pit is small. The accumulations are dominated by faunal remains; also, potsherds of several vessels, prismatic blades, inserts, burins, the shank of a composite fishhook, fragments of bone needle (Fig. 6, *10*) and shell beads were discovered. Ashy soil is noted at the location of one accumulation.

In upper layer VI, seven stone structures are noted that, possibly, were used as hearths (Ibid). Semi-circular and continuous oval structures of 1.6–0.8 × 1.2–0.5 m in size were encountered. Degraded ash pits have been recorded in some of them. Faunal remains, potsherds from different vessels, prismatic blades, and inserts have been discovered near the hearths. The main part of the archaeological material of upper layer VI is confined to the concentration on the coastal portion of the excavation area. Soil at this place is ashy. The accumulation also included faunal remains, potsherds from different vessels, stone tools (prismatic blades, inserts, a burin, an adze-like tool), a harpoon, and a bone part of a composite tool (Fig. 6, *11*, *12*). The set and typology of ceramic and stone tools found in lower and upper layers VI are similar, which suggests the formation of complexes within the common cultural tradition, in the same chronological interval (Ibid).

The number of hearths discovered in layers VII and VI, and their physical proximity, indicate that the system of stone structures reflects several subsequent occupations in various seasons, while the relatively minor thickness of ash pits shows that the occupations were short-term.

Judging by the occurrence of faunal remains in hearths and fireplaces as well as near them, carcasses

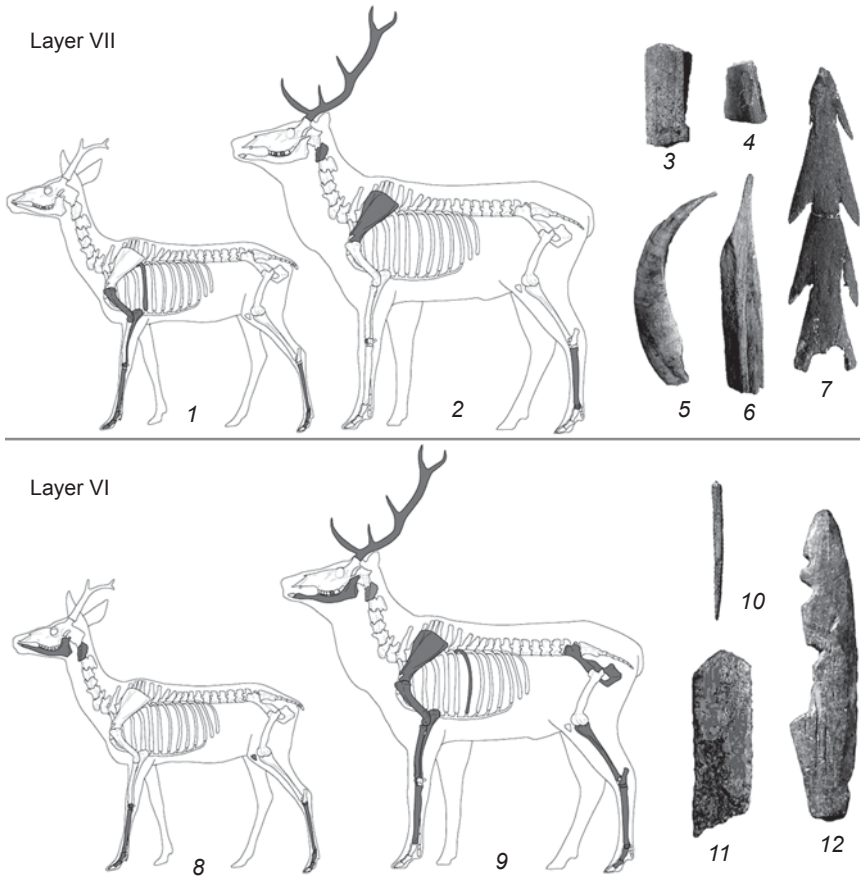

Fig. 6. Skeletal elements of ungulates (marked by black color) and bone tools.

might have been processed and partially consumed directly at the site. This is confirmed by traces on some bones. In materials of layer VII, bones with butchering and gnawing marks, burned bones, and bone tools total 299 specimens, or 28 % of the total quantity of faunal remains from this layer. They belong mainly to mammals. Burned bones, including 15 belonging to Baikal seals, several to ungulates, and one to a bird, prevail (293 total specimens were burnt), which can be immediately associated with hearths and fireplaces. Bones with traces of being worked and bones in the form of tools are represented by 10 specimens. Gnawing marks left by carnivores have been discovered on one long bone.

In the assemblages of layer VI, bones with modification traces are represented by 64 specimens, which comes to 5 % of the total quantity of faunal remains from this layer. These are also dominated by burned bones (53 specimens, including 15 from Baikal seals). Cut marks have been found on a Baikal seal tibia, a red deer humerus, an ungulate rib, and on an indeterminate fragment of mammal bone. In addition, five bones, retouched and in the form of tools, and two bones with carnivore gnawing marks have been found. The presence of the latter may indicate that animal bones at the site were also eaten by carnivores; but, since these finds are single, such actions can be considered as minimal.

Species composition of animals

Faunal materials found as a result of excavations of layers VII and VI are represented by 2351 specimens (Table 2). Most of these (94 % of the total amount of faunal remains) belong to mammals. Species identification in this category is possible according to the following taxonomic levels (Table 2): species (roe deer, red deer, elk, boar, Baikal seal), family (cervids with subdivision to large and smaller sized animals), order (artiodactyls and carnivores), and class (large and small mammals). Other fauna are represented by 17 bird bones and 112 fish remains, as well as by several fragments of shells (Table 2).

In the remains of birds, postcranial elements of skeletons of at least two cormorants, a coracoid bone of raven, a humerus and a coracoid bone of bird belonging to the genus of sea eagles, a phalanx and a furcula fragment of representative of the duck family, and remains of vertebrae indeterminate above the class level have been found. Several elements of fish skulls were attributed to

Table 2. **Faunal remains**

Taxon	Name	Layer VII		Layer VI		Total
		Number of bones	Number of animals, min	Number of bones	Number of animals, min	
Mammalia	Mammals	711	…	886	…	1597
Mammalia large		31	…	28	…	59
Mammalia medium		30	…	15	…	45
Artiodactyla	Ungulates	7	…	1	1	8
Artiodactyla large		–	–	4	…	4
Artiodactyla medium		5	…	5	…	10
Cervidae	Cervids	–	–	4	2	4
Cervidae large		5	1	11	2	16
Cervus elaphus	Red deer	19	1	13	2	32
Alces alces	Elk	–	–	1	1	1
Cervidae medium		7	1	7	2	14
Capreolus pygargus	Roe deer	9	2	10	2	19
Sus scrofa	Boar	2	1	2	1	4
Carnivora medium	Carnivores	1	1	1	1	2
Phoca sibirica	Baikal seal	101	5	296	9	397
Aves	Birds	3	…	–	–	3
Anatidae	Duck family	2	1	–	–	2
Phalacrocax carbo	Cormorant	9	2	–	–	9
Haliaeetus sp.	Genus of sea eagles	1	1	1	1	2
Corvus c.f. *corax*	Raven	–	–	1	1	1
Pisces unidentified	Fish	107	…	1	1	108
Thymallus articus	Grailing	3	2	–	–	3
Acipenser baeri baic.	Sturgeon	–	–	1	1	1
Mollusca	Shells	–	–	6	…	6
Unidentified		4	…	–	–	4
Total		1057	…	1294	…	2351

at least two grayling and a sturgeon. Other fish remains, represented by scale, ribs, and skull fragments, are unidentifiable.

Most of the faunal remains (17 % of the total amount of bones, or 75 %, if we consider only fauna that can be determined to the order level) belong to Baikal seals. Remains of this species belong to at least 14 animals. Elements of all skeleton parts are available, without any predominance of bones from particular parts of animal carcasses. The second most significant group consists of ungulates: 4.8 % of the total amount of faunal remains, or 21 %, if we consider only fauna that can be identified to the order level. Here, the bones of roe deer and red deer prevail; also, a fragment of an elk radius and remains of boar (a skull fragment, the second phalanx, and a split canine) are noted.

Large and small ungulates are represented by elements of various skeleton sections, though mainly by bones of limbs and head with fragments of antlers (Fig. 6, *1*, *2*, *8*, *9*). It remains unclear to what extent this situation reflects the selection of certain parts of the carcasses of these animals; since, among mammal remains, elements of other parts if the skeleton are also encountered—for example, fragments of ribs and vertebrae, whose fragmentary nature makes identification of species difficult.

Determination of age and sex of animals

Owing to the fact that bones and teeth of Baikal seals and ungulates prevail among the faunal remains at the

Sagan-Zaba II site, additional studies were carried out to determine the sex and age of some of these animals.

The age of Baikal seals was determined by two methods. The first method is based on assignment of individual skeletal elements to generalized age categories according to the degree of fusion of proximal and distal epiphyses on the bones (mainly, on limbs) (Storå, 2000), while the second relies on calculation of annual structures in dentine from thin-sections of teeth. The latter was developed and applied earlier to analyzing teeth of Baikal seals from a number of multilayered sites in the Cis-Baikal region (Weber, Goriunova, Konopatskii, 1993; Weber et al., 1998). In contrast to the previous studies, final calculations were performed taking into account a minimal number of Baikal seals to preclude the repeated use of the same animals in interpretation of results.

Judging by the degree of epiphyses fusion, seals are represented by remains of at least one animal under one year of age and two mature animals (young and middle-aged) in layer VII; and by two animals under one year of age, one immature, and three middle-aged animals in layer VI. Analysis of dentine-layers from thin-sections of 10 teeth has demonstrated that they belonged to two Baikal seals under one year of age in layer VII; two animals under one year of age, five animals of 1–2 years of age, and one seal of five years of age in layer VI. Generalized data on the age-indicators of Baikal seals are given in Fig. 7.

The relative age of ungulates was determined by the state of their teeth, and the degree of the epiphyses fusion of some long bones. These data have been obtained for four roe deer (Tomé, Vigne, 2003). Remains of two animals older and younger than 1.3 years are represented in layer VII, and those of animals before 12 months and older than 1.3 years in layer VI. Bones of red deer between 2 and 4 years of age have been found in layer VI. Judging by the presence of cervid antlers, it can be assumed that some bone remains belonged to male deer (bucks). A canine of an adult male boar was found in layer VII (determination of sex after: (Hillson, 2005: 131)).

Site seasonality

The seasons of use of the Sagan-Zaba II site were reconstructed on the basis of early complexes, using the above analysis of dentine layers from thin-sections of Baikal seal teeth, and by the presence or absence of those animal species that are only available in the Cis-Baikal region during the warm months of the year, such as migrating birds.

In general, the results of the analysis of dentine-layers from thin-sections of 10 Baikal seal teeth point to the death of these animals during spring or summer time (from March to September): layer VII—two animals under one year of age were killed in the period from March to June; layer VI—the five-year Baikal seal was hunted during March–June, three animals (1–2 years of age) during May–June, and the remainder (under one year of age and 1 year of age) from July to September (Fig. 7). Thus, these animals were hunted during two seasons: in spring, when they go out onto ice and are found near breathing holes, thus forming gatherings on the disappearing ice; and in summer during the opening period of Lake Baikal, when seals are distributed across the whole lake, and groups of them come ashore (Pastukhov, 1993).

The presence of bones of migrating birds also suggests the use of the site during the warm season. For example, ducks and cormorants, which remains have been found in layer VII, and sea eagles, whose bones have been discovered in both layers under study, might have been hunted near Sagan-Zaba bay from the end of March to the beginning of October during their arrival in the Cis-Baikal region (Fig. 7). However, it must be borne in mind that some sea eagles stay for the winter in this region

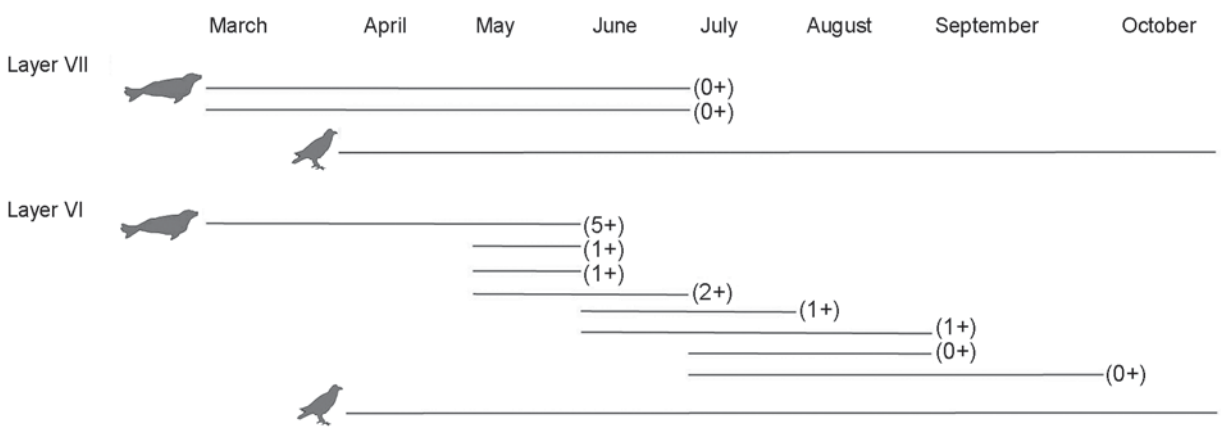

Fig. 7. Seasonality of death of Baikal seals (the age of animal is specified in parentheses) and birds at the Sagan-Zaba II site.

sometimes (Ptitsy Baikala, 2005). Thus, the available data on the studied complexes suggest that the Sagan-Zaba II site was mainly used in the spring and summer months, but other seasons are not excluded.

Conclusions

On the basis of the analysis of a series of radiocarbon dates and calculation of their combined averaging indicators, it was possible to determine the offset between uncalibrated dates obtained from remains of ungulates and Baikal seals (682 years for layer VII and 509 years for layer VI). As a result, the dating of early complexes of the Sagan-Zaba II habitation site was better defined. Taking the correction of dates obtained from Baikal seal bones into account, layer VII is now dated to the period between 9120 and 8610 cal BP, and layer VI to the period between 8340 and 7880 cal BP.

Planigraphic analysis has demonstrated that faunal remains in layers VII and VI were mainly located in concentrations along with stone and bone tools, and also with pottery in the area of the hearths and fireplaces of layer VI. These are probably undifferentiated domestic waste. No independent accumulations of faunal remains have been recorded in the layers. Concentration of the archaeological materials in the area of hearths and fireplaces is typical of all complexes of the Early–Middle Holocene; not only on the shore of Lake Baikal, but in the Cis-Baikal region as a whole.

Most likely, the site featured short-term, seasonal occupations, as indicated by the distribution of hearths and other materials, minor thickness of fireplaces, the absence of specialized production areas, and by relatively small total amount of faunal remains. The results of analysis of dentine layers from thin-sections of Baikal seal teeth, as well as the availability of animal bones from species which are only present during the warm months of the year in the Cis-Baikal region (for example, those of migrating birds), are consistent with the model of seasonal site-use. Thus, it can be assumed that Sagan-Zaba bay was inhabited in the period between 9120 and 7880 cal BP, predominantly during the spring and summer seasons.

To judge by the species composition of the animals, the subsistence activity in this period was based upon the hunting of Baikal seals and ungulates. Bird hunting and fishing also had a definite significance. The large quantities of broken bones ("kitchen waste" and production waste from bone tools) available in the complexes and their localization mainly near hearths and fireplaces, together with the presence of bones with traces of butchering and burned bones, suggest that hunting, butchering, and consumption of some animals took place nearby, or directly in the bay. Notably, antlers and bones of ungulates were used to make tools. The results of the analysis of faunal materials from layers VII and VI of the multilayered habitation site Sagan-Zaba II are indicative of a wide use of natural resources. A noteworthy detail is that no changes in the hunting of animals of one or another species can be observed in the studied complexes throughout the duration of the time-interval under consideration (from 9120 to 7880 cal BP).

References

Aseyev I.V. 2003
Yugo-Vostochnaya Sibir v epokhu kamnya i metalla. Novosibirsk: Izd. IAE SO RAN.

Buck C.E., Christen J.A., James G.N. 1999
BCal: An online Bayesian radiocarbon calibration tool. *Internet Archaeology*, No. 7. URL: http://intarch.ac.uk/journal/issue7/buck/

Dolganov V.A., Goriunova O.I., Novikov A.G., Veber A.V. 2011
Kompleks s punktirno-grebenchatoi keramikoi i ego mesto v neolite Pribaikalya (po materialam mnogosloinogo poseleniya Sagan-Zaba II). In *Drevniye kultury Mongolii i Baikalskoi Sibiri*, iss. 2. Irkutsk: Izd. Irkut. Gos. Tehn. Univ., pp. 75–81.

Dolganov V.A., Goriunova O.I., Novikov A.G., Veber A.V. 2013
Kompleksy s keramikoi posolskogo tipa v neolite Pribaikalya: po materialam V verkhnego sloya geoarkheologicheskogo obyekta Sagan-Zaba II. *Vestnik NGU*. Ser.: Istoriya, filologiya, vol. 12. Iss. 7: Arkheologiya i etnografiya: 125–132.

Goriunova O.I., Dolganov V.A., Novikov A.G., Veber A.V. 2012
Ranniy neolit Priolhonya: po materialam VI kulturnykh sloev geoarkheologicheskogo obyekta Sagan-Zaba II. In *Fenomen geoarkheologicheskoi mnogosloinosti Baikalskoi Sibiri: 100 let Baikalskoi nauchnoi arkheologii*. Irkutsk: Izd. Irkut. Gos. Univ., pp. 86–93. (Evraziya v kainozoe: Stratigrafiya, paleoekologiya, kultury; iss. 1).

Goriunova O.I., Novikov A.G., Veber A.V., Vorobyeva G.A., Orlova L.A. 2008
Zaversheniye raskopok Rossiysko-Kanadskoi ekspeditsii v bukhte Sagan-Zaba na Baikale. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. 14. Novosibirsk: Izd. IAE SO RAN, pp. 32–35.

Goriunova O.I., Novikov A.G., Vorobyeva G.A., Veber A.V., Lozei R.D., Nomokonova T.Y., Orlova L.A. 2007
Prodolzheniye rabot Rossiysko-Kanadskoi ekspeditsii v bukhte Sagan-Zaba na Baikale. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. 13. Novosibirsk: Izd. IAE SO RAN, pp. 212–215.

Hillson S. 2005
Teeth. Cambridge: Cambridge Univ. Press.

Nomokonova T., Losey R.J., Goriunova O.I., Weber A.W. 2013
A fresh water old carbon offset in Lake Baikal, Siberia and problems with the radiocarbon dating of archaeological sediments: Evidence from the Sagan-Zaba II Site. *Quaternary International*, No. 290/291: 110–125.

Nomokonova T., Losey R.J., Weber A., Goriunova O.I. 2010

Late Holocene subsistence practices among Cis-Baikal pastoralists, Siberia: Zooarchaeological insights from Sagan-Zaba II. *Asian Perspectives: The Journal of Archaeology for Asia and the Pacific*, vol. 49 (1): 157–179.

Novikov A.G., Goriunova O.I., Veber A.V. 2014

Mezoliticheskiy kompleks geoarkheologicheskogo obyekta Sagan-Zaba II (oz. Baikal). *Vestnik NGU*. Ser.: Istoriya, filologiya, vol. 13. Iss. 5: Arkheologiya i etnografiya: 117–124.

Okladnikov A.P. 1975

Otchet o raskopkakh mnogosloinogo neoliticheskogo pamyatnika v bukhte Zagan-Zaba v 1974 g. Novosibirsk. Arkhiv IA RAN. R-1. No. 5567.

Pastukhov V.D. 1993

Nerpa Baikala. Biologicheskiye osnovy ratsionalnogo ispolzovaniya i okhrana resursov. Novosibirsk: Nauka.

Ptitsy Baikala. 2005

V.E. Egorov, A.A. Vasilchenko, N.G. Skryabin, V.A. Podkovyrov, S.V. Pyzhyanov. Kemerovo: Kuzbassvuzizdat.

Reimer P.J., Bard E., Bayliss A., Beck J.W., Blackwell P.G., Bronk-Ramsey C., Grootes P.M., Guilderson T.P., Haflidason H., Hajdas I., Hatte C., Heaton T.J., Hoffman D.L., Hogg A.G., Hughen K.A., Kaiser K.F., Kromer B., Manning S.W., Niu M., Reimer R.W., Richards D.A., Scott E.M., Southon J.R., Staff R.A., Turney C.S.M., van der Plicht J. 2013

IntCal13 and Marine13 radiocarbon age calibration curves 0-50,000 years cal BP. *Radiocarbon*, vol. 55 (4): 1869–1887.

Storå J. 2000

Skeletal development in grey seal *Halichoerus grypys*, the ringed seal *Phoca hispida botnica*, the harbour seal *Phoca vitulina vitulina*, and the harp seal *Phoca groendlandica*: Epiphyseal fusion and life history. *Archaeozoologia*, No. XI: 199–222.

Stuiver M., Reimer P.J. 1993

Extended ^{14}C database and revised CALIB radiocarbon calibration program. *Radiocarbon*, vol. 35: 215–230.

Tomé C., Vigne J.-D. 2003

Roe deer (*Capreolus capreolus*) age at death estimates: New methods and modern reference data for tooth eruption and wear, and for epiphyseal fusion. *Archaeofauna*, No. 12: 157–173.

Vorobyeva G.A. 2010

Pochva kak letopis prirodnykh sobytiy Pribaikalya: problemy evolyutsii i klassifikatsii pochv. Irkutsk: Izd. Irkut. Gos. Univ.

Weber A.W., Goriunova O.I., Konopatskii A.K. 1993

Prehistoric seal hunting on Lake Baikal: Methodology and preliminary results of the analysis of canine sections. *Journal of Archaeological Science*, No. 20: 629–644.

Weber A., Link D.W., Goriunova O.I., Konopatskii A.K. 1998

Patterns of prehistoric procurement of seal at Lake Baikal: A zooarchaeological contribution to the study of past foraging economies in Siberia. *Journal of Archaeological Science*, No. 25: 215–227.

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Wooden Saddle-Trees from Yaloman II in the Altai: An Interdisciplinary Analysis*

The equipment of a riding horse is a key element in the material culture of nomadic pastoralists, very informative in terms of the ethnic and cultural history of the various nomadic groups of the Scythian, Hunno-Sarmatian, and Old Turkic periods, when horses were buried with their owners. This equipment is highly relevant to assessing the age of the burial. We describe wooden saddle-trees from a Hunno-Sarmatian Age cemetery Yaloman II in the Altai, and compare them with similar finds from other places. The technological features of pommel, cantle, and bars are assessed, the tools needed to make them are evaluated, technological operations involved in assembling the saddle-tree are listed, and a graphic reconstruction of the wooden saddle-tree is proposed.

Keywords: *Altai, Hunno-Sarmatian period, nomads, horse equipment, saddle-trees.*

Introduction

The purpose of the saddle for horse-riding is not only to provide the rider with the maximum comfort and protect the back of the horse from constant friction and hits from the body of the rider, but also to foster the right posture of the rider for ensuring the contact with the horse and the ability to control the horse during riding. The structure of the saddle-tree (the frame) is of great importance for accomplishing these goals (Myuzeler, 1980: 13; Gubarev, 1970: 289; Borris, 1998: 82–98).

The culture of modern peoples who follow the traditions of ancient and medieval nomads is a complex heterogeneous phenomenon, which has evolved over thousands of years through broad ethnic and intercultural contacts. The analysis of the artifacts belonging to that richest civilization of the Eurasian steppes (the Altai, the Sayan Mountains, Siberia), performed using the archaeological complexes containing horse burials, makes it possible to obtain a more objective view on the ethnic history and cultural genesis of the peoples inhabiting this vast region than was previously possible. Today, the elements of horse equipment are one of the most numerous categories of archaeological finds.

The genesis of saddles "with rigid base" (Kyzlasov, 1969: 135–139) has equal importance in the study of forms and structures of saddles as one of the main components of horse-equipment. The materials on this subject, which have been accumulated over many decades, are mostly published and well analyzed; which allows scholars to conduct interdisciplinary and historical-ethnographic

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studies, across a wide chronological range, of the riding-equipment used among the nomads of Siberia and Central Asia (Tkachenko, 2009).

Wooden objects with various functions, including rigid saddle-trees from the burials of the second half of the 4th–first half of the 5th century at the Yaloman II cemetery (the Russian Altai)*, which were found in the 2000s, provide additional opportunities for special interdisciplinary studies with the participation of experts in wood-processing, dendrochronology, and xylotomy (Tishkin, Mylnikov, 2007, 2008; Mylnikov et al., 2012). The findings of these studies provide further data on the above sources for scholarly use.

Almost completely preserved parts of a rigid wooden saddle-tree without stirrups (Collection No. 181/301–303, 337–340), and archaeologically intact bars and fragments of other parts of a second saddle (Tishkin, Gorbunov, 2003: Fig. 2, *4–7*; Tishkin, 2005: 61, fig. 354–359; Tishkin, 2011: 175, fig. 5), were found in grave No. 1 during the excavations of burial-mound No. 33 at the site of Yaloman II. The grave-pit of burial-mound No. 29 at the same site contained numerous fragments of wood. Their analysis made it possible to identify them as elements of one more wooden saddle-tree. Similar objects were found in burial-mounds No. 30 and 31 (Tishkin, Mylnikov, 2008: 98–99; Tishkin, 2011: 174). The discovered objects constitute important sources for understanding the stages in the evolution of horse equipment (Savinov, 2005; Komissarov, 2005; Hudiakov, Komissarov, 2003).

Results

The entire process of manufacturing a rigid wooden saddle-tree can be reconstructed from the technical and technological analysis of archaeologically intact artifacts belonging to a single object: two bars, a pommel, and a cantle from grave No. 1 in burial-mound No. 33 at the Yaloman II cemetery (Fig. 1). They preserve all traces of processing and the units needed for technological and graphic reconstruction of the object. During the final assembly, the elements were connected together by a series of through holes, grooves, and leather straps in a sufficiently rigid, durable, and comfortable frame—the saddle-tree.

The dendrochronological analysis determined the approximate age of the trees that provided timber for the bars, the pommel, and the cantle, while the xylotomic analysis showed that all the blanks were made of birch-trunks of large diameters. The middle part of the trunk that remained after splitting off one third of its diameter on the opposite sides was used for producing each bar of the saddle. The pommel and cantle were carved from the split sides of the same trunk. The technological analysis of the traces remaining from the blades of woodworking tools, and their comparison with the original tools found in the burial-grounds of the same period (Soyonov, Konstantinova, 2013), made it possible to identify an approximate set of carpenter's tools used in the Hunno-Sarmatian time, which included axe, adze, set of chisels, knife, and flat drill (reamer).

Bars are two ornately shaped boards of curved profile with wide recesses-cavities made with chisels for attaching the pommel and the cantle (Fig. 2). The length of the left bar is 41.5 cm; its width near the rectangular recess for attaching the girth strap is 13.8 cm. The length of the right bar is 42 cm; the greatest width of the surviving part is 11.2 cm. The upper edge of each bar has a smooth arched groove 4–5 cm deep. The width of the surviving parts of elements at the pommel is 12.8–13.9 cm; at the cantle it is 12.2–14.4 cm. Thickness of bars at the point where the pommel was attached is 1.6–2.5 cm; that at the point where the cantle was attached is 1.5–5.0 cm. The width of the groove for the pommel is 8–10 cm; its depth is 2.3–2.6 cm. The width and depth of the groove for the cantle are 2.8–3.7 and 0.5–0.8 cm respectively. Ten to twelve holes with diameters from 3.6 to 7.9 mm were drilled at the ends of each bar at the place where the pommel and cantle were attached; two smaller holes (2 mm in diameter) were drilled behind each group of larger holes. Bars have an arched profile in longitudinal section, corresponding to the curve of the rider's thighs (Fig. 2, *1*). Apparently, the craftsman deliberately chiseled down this shape with a pick adze, and then trimmed it with a finishing adze or the end of the axe-blade to produce a more comfortable seat for the rider. Faint traces of these tools of primary treatment can be seen on the reverse sides of the bars; the frontal sides, which underwent secondary treatment, are smoothed. Pommel and cantle were attached to the bars using the pairs of holes. For firmer attachment, the planes of the bases of pommel and cantle were fitted to the arched outline of the fitting places (Fig. 2, *2*, *3*) by fine and frequent whittling with a knife.

Grooves-sockets were carved with a narrow-bladed chisel on the reverse planes of the bars (the inner surfaces adjacent to the back of the horse) between the holes for mounting rawhide straps or tendons. These grooves were intended to hide flush the straps and their knots which could damage the horse's back during riding (Fig. 1, *2*). Presumably, the outlines of the grooves were cut with a knife.

Four cavities 2 mm in diameter were drilled in one bar in the oblique groove (25–30 mm wide, 2 mm deep) for girth straps at a distance of 20 mm from each other; in

*All finds are kept in the Museum of Archaeology and Ethnography of the Altai, Altai State University, Barnaul.

Fig. 1. Complete set of a rigid wooden saddle-tree: bars, pommel, and cantle.
1 – front side; *2* – reverse side.

Fig. 2. Side view of the bars (*1*) and the fragments, showing the technology of manufacturing fitting places and elements at the ends of the bars for attaching the pommel and the cantle (*2*, *3*).

one of the cavities, a small wooden nail with a flattened cap has survived (Fig. 3). With the help of five or six of such nails on each side, girth leather straps were securely fastened to the bars, allowing the saddle to be rigidly mounted on horse's back.

The inner surface on one of the bars shows faint traces of axe and adze blades. Obviously, the manufacturers of rigid saddle-trees did not always pay due attention to careful secondary processing of the inner surfaces of the bars. They might have hoped that felt saddle-blankets

placed under the saddle would protect the back of the horse from being injured by individual defects of primary treatment. The outer surfaces of the bars, the pommel, and the cantle are smoothened, apparently as a result of the frequent use of the saddles.

Fig. 3. Fastening devices at the ends of the bars on the external plane of the saddle.

Pommel (Fig. 4, *1*) is a plate in the form of an arch in a half-circle; it is an elongated oval in cross-section, with two flattened bases adjusted to the profiles of the fitting-places on the bars. The height of the arch is 19.2 cm; its width at the bases is 29 cm. Two holes with the diameter of 6–7 mm for attaching the pommel to the bars were drilled in the edge of each base. They are finely polished, indicating long-term use of the saddle. A piece of tendon has survived in one of the holes. In the middle, the plate has an arched recess 8 cm wide and 5.3 cm high. Both the width and thickness of the plate are 2.5 cm at the bottom and 1.6 cm at the top. All planes and faces of the pommel, which were given oval shapes, preserve the traces of secondary treatment (smoothing and polishing). On one edge, a widening crack along the annual rings, caused by the climatic impact on wood in the burial pit, cuts through the plate.

Cantle (Fig. 4, 2) is a plate in the form of a low arch in one-third of a circle. The height of the arch is 10.5 cm; its width at the bottom is 24 cm. On one side of the plate, the surface is flat with a barely visible convexity; on the other side, two faces were rasped away edgewise in the middle. The width of the plate is 3.8–5.2 cm; its thickness is 1.4 cm at the bottom and 1.6–2.1 cm at the top. Unlike those in the pommel, the fastening holes in the cantle are 6–7 mm in diameter, and they were drilled with a significant shift from the edge of the base: three holes on the right are almost in the middle

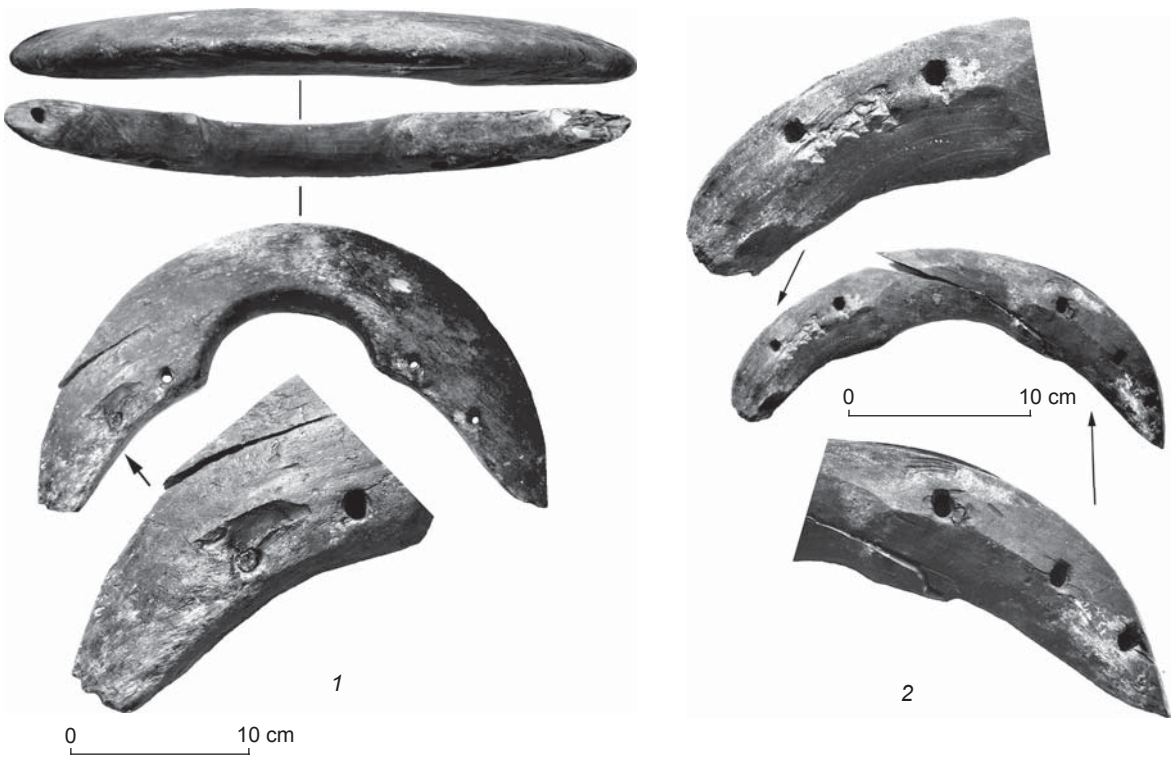

Fig. 4. Pommel (*1*) and cantle (*2*).

of the plate; two holes on the left are closer to its upper edge. The plate is almost entirely broken obliquely along an annual ring. At the breakage, the traces of the cracks can be seen that have occurred for the climatic reasons mentioned above. The left end of the cantle is blunt as a result of the process of decay and degradation of wood.

Bars of the rigid saddle-tree of the second saddle (Fig. 5) have survived in varying degrees of preservation: the middle and lower parts of one bar are in a worse condition than in the other. The length of the left bar is 40.6 cm; that of the right bar is 41.0 cm; the widths at the recesses for attaching a girth strap are 14.5 and 10.0 cm respectively. The width at the ends of the bars at the place where the pommel was attached is 11.5–12.8 cm, and where the cantle was attached, 12.2–13.2 cm; the thicknesses are 1.5–2.2 and 1.5–5.0 cm respectively. The cavities for the pommel and cantle have a depth of 2.0 and 0.5–0.7 cm, and widths of 7.5–10.0 and 3.2–4.8 cm. Ten to twelve holes with diameters ranging from 3.5 to 8.0 mm, and two small holes behind these (2 mm in diameter) were drilled in the ends of each bar, in the places where the pommel and cantle were attached. Deep grooves for the fastening rawhide straps and their knots were cut on the reverse (inner) planes of the bars between the holes for straps (Fig. 5, *2*). It can be concluded that in general the design and parameters of the bars from the second saddle are the same as those from the first saddle, which indicates a certain standardization in the manufacturing of rigid wooden saddle-trees.

In addition to the elements described above, the following fragments have been identified (Fig. 6): more than a half of the cantle, and three parts of bars with cavities for attaching the pommel and the cantle. These fragments preserved the traces of processing; the analysis of these traces made it possible to reconstruct the technology of producing rigid saddle-trees. The holes

Fig. 5. Bars of a rigid wooden saddle-tree.
1 – front side; *2* – reverse side.

Fig. 6. Fragments of a rigid wooden saddle-tree: cantle (*1*) and bars (*2–4*).

through which the pommel and cantle were attached to the front and rear parts of the bars are mostly round (5–6 mm in diameter), drilled by a flat drill or reamer. Some of them acquired an oval shape from long use. Individual holes were cut by a chisel with a rectangular blade. Round holes 4 mm in diameter, and square holes measuring 4 × 4 mm are located at a distance of 2.2 cm from each other.

Fragments of a saddle-tree have also been identified among the remains of wooden artifacts from burial-mound No. 29 at Yaloman II (Collection 621/269). They may include small fragments of bars, pommels, and cantles with traces of secondary processing and use (smoothing), as indicated by the analysis of their configurations, the thickness of the fragments, and the processing features of their planes. The wood has a poor degree of preservation; however, the type of wood can be identified as birch. The collection contains flat fragments and arched pieces of sharpened planks. The sizes of fragments range from 3.0 to 14.5 cm. Many fragments have both intact and partially preserved holes 4–6 mm in diameter. Many of the remains are amorphous. These artifacts presumably include large fragments of saddle-bars (Fig. 7, *1*). The traces of the secondary treatment are weak. Small smoothened sections of the oval and sharpened ribs have survived. The bars were probably made of blanks with a highly twisted texture. Some fragments preserve small areas with weak traces of trimming. We can reliably identify four large fragments of the pommel and cantle, which represent halves of arched and rounded plates, sharpened at the ends, with the traces of secondary treatment and with three holes 4–6 mm in diameter (Fig. 7, *2*). The fragments can be identified with high probability as the pommel and the cantle of a single saddle, or as two cantles of two saddles.

Summing up the results of the studies, we may say that a significant number of wooden objects of a sufficiently good degree of preservation have been found in the last decade during the excavations of burial sites of the so-called Hunno-Sarmatian time in Southern Siberia. The availability of high-quality wooden structures and products with different functions indicates a fairly high level of wood-processing in the Altai in 200 BC–500 AD. Numerous elements of horse-equipment, which were made of wood—in particular, well-preserved elements of rigid saddle-trees—became not only a reliable criterion for establishing the relative chronology of the monuments, but also excellent material for special interdisciplinary studies on woodworking technology, xylotomy, and dendrochronology.

Joint efforts of scholars from different areas established the type and approximate age of the trees whose timber was used for making rigid wooden saddle-trees. The technological aspects of selecting the raw material and manufacturing bars, pommels, and cantles for each saddle, as well as the methods of their attachment to each other for forming a single object, have been identified. On the basis of analysis of early sources and also variations of forms and structural features of "soft", "semi-soft", and "semi-rigid" saddles of various types (Gryaznov, 1950: 54–58, pl. VII, VIII, XI, XVI, XXII; Rudenko, 1948: 14–15; 1953: 164–214; 1960: 128–132, pl. LXIII, *1–5*; Vainshtein, Kryukov, 1984: 122; Tkachenko, 2003; Klyashtorny, Savinov, 2005: 189; Stepanova, 2006, 2012, 2014; Kushayev, 1978: 81, fig. 9, 9a; Brosseder, Miller, 2012: 118; Polosmak, Bogdanov, Tseveendorj, 2011: 92, fig. 4, 5; 2013; Bogdanov, 2014: 123; Polosmak, Bogdanov, 2015: 55–56, fig. 3, *12*, *13*; and others) with wooden bases, it has been suggested that saddles with such bases emerged in the Scythian-Saka period, and were enhanced in the subsequent periods. The classic nomadic type of

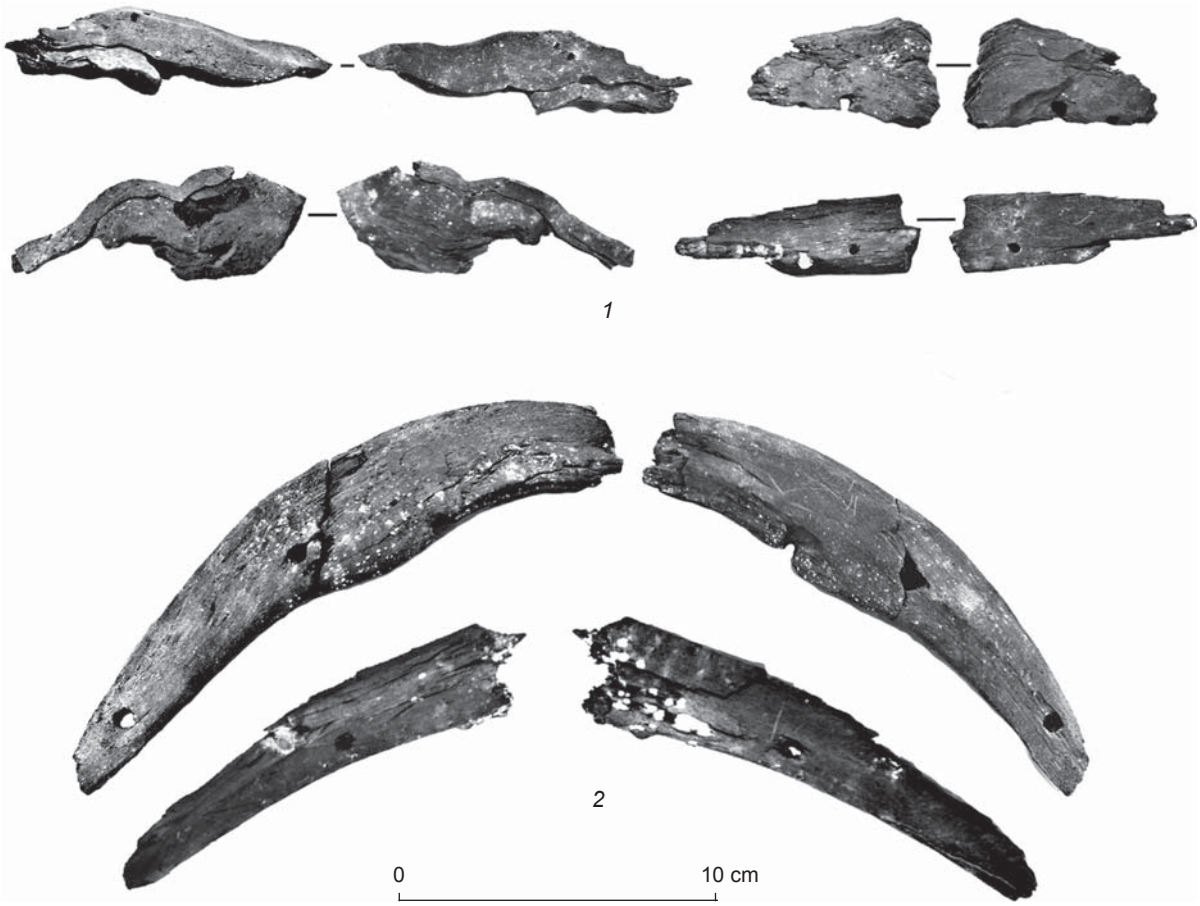

Fig. 7. Amorphous fragments of bars (*1*) and fragments of pommel and cantle (*2*).

saddle with a rigid wooden base received its final form in the Old Turkic period in the Altai (Savinov, 1977, 1984: 36, 45–55; Tkachenko, 2003). All parts of the saddle-tree began to be made from a single piece of log, and fastened together using a rigid tongue-and-groove joint. The saddles, whose wooden bases have been found in the graves of mounds No. 29 and 33 at the Yaloman II cemetery, are an intermediate variant between the Xiongnu type with a semi-soft base, and the Turkic saddle with a rigid base, the earliest version of which has been found in the Altai (Ibid.).

The comprehensive analysis of all components of the rigid wooden saddle-tree (two bars, the pommel, and the cantle from grave No. 1 in burial-mound No. 33 at the Yaloman II cemetery) makes it possible to propose a graphic reconstruction of the saddle-tree (Fig. 8).

Fig. 8. Reconstruction of a rigid wooden saddle-tree from grave No. 1 in burial-mound No. 33 at the cemetery of Yaloman II.
1 – middle part of tree-trunk used for manufacturing the bars; *2*, *3* – side parts of the trunk used for manufacturing the pommel and the cantle; *4* – graphic reconstruction of the saddle-tree.

Conclusions

Comparative typological analysis of the shape and external appearance of wooden saddle-trees and the genesis of their structural elements, together with their manufacturing features over a period from the Scythian-Saka time to the Old Turkic time, show progressive development and improvement of this essential part of horse equipment. In terms of technology, the saddles known today can be divided into several typological groups, depending on the functional load of the wooden base: 1) with leather cushions (bars), sewed wooden arches (pommels and cantles), bracers and plates with decorative carving—the morphogenic *soft* type, which goes back to the Scythian-Saka period; 2) with movable, not rigid frame of wooden planks and laths underneath leather cushions, depending on the size and parameters of the material of the base—the *semi-soft*, *semi-rigid* type, which belongs to the Xiongnu period; 3) with the base of two bars, the pommel, and the cantle made from a single piece of log and connected by means of combinations of rows of holes and thick rawhide straps or tendons—the *rigid* type, the product of the Altai tribes of the Rouran (pre-Turkic) period, and 4) with the saddle-tree of two wooden bars, pommel and cantle, fastened together by means of tongue-and-groove joints and fasteners (bone and metal onlays, nails)—the *rigid* type, the improvement by nomads of the Old Turkic period.

Further study of materials from the archaeological complex described above will make it possible to solve the cultural and chronological problems, and to reconstruct the subsistence system of the Altai population in the pre-Turkic period.

References

Bogdanov E.S. 2014
Verkhovye sedla iz noin-ulinskikh pogrebeniy. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. XX. Novosibirsk: Izd. IAE SO RAN, pp. 121–123.

Borris A. 1998
Snaryazheniye dlya loshadei i poni. Moscow: Akvarium.

Brosseder U., Miller B.K. 2012
Reiterkrieger der Xiongnu. In *Steppenkrieger: Reiternomaden des 7.–14. Jahrhunderts aus der Mongolei*. Bonn: LVR-Landes Museum, pp. 115–125.

Gryaznov M.P. 1950
Pervyi Pazyrykskiy kurgan. Leningrad: Izd. Gos. Ermitazha.

Gubarev G.V. 1970
Kazachiy istoricheskiy slovar-spravochnik, vol. 3. San-Anselmo: Izdatel A.I. Skrylov.

Hudiakov Y.S., Komissarov S.A. 2003
Osobennosti etnokulturogeneza kochevnikov Vostochnogo Turkestana v drevnosti i srednevekovye. In *Rossiya, Sibir i Tsentralnaya Aziya: Vzaimodeistviye narodov i kultur: Materialy IV Mezhdunar. nauch-prakt. konf.*, V.S. Boiko (ed.), iss. 4. Barnaul: pp. 314–321.

Klyashtorny S.G., Savinov D.G. 2005
Stepnye imperii drevnei Evrazii. St. Petersburg: Filol. Fak. St. Pet. Gos. Univ.

Komissarov S.A. 2005
Vsadniki Sintszyana. In *Drevniye kochevniki Tsentralnoi Azii (istoriya, kultura, nasledive): Materialy Mezhdunar. nauch. konf.*, S.V. Danilov, P.B. Konovalov (eds.). Ulan-Ude: Izd. BNC SO RAN, pp. 116–118.

Kushayev G.A. 1978
Novye pamyatniki zheleznogo veka Zapadnogo Kazakhstana. *KSIA*, No. 154: 76–82.

Kyzlasov L.R. 1969
Istoriya Tuvy v sredniye veka. Moscow: Izd. Mosk. Gos. Univ.

Mylnikov V.P., Bykov N.I., Slyusarenko I.Y., Tishkin A.A. 2012
Sravnitelnyi analiz derevyannykh predmetov iz arkheologicheskikh pamyatnikov Altaya v svete mezhdistsiplinarnogo podkhoda. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. XVIII. Novosibirsk: Izd. IAE SO RAN, pp. 242–248.

Myuzeler V. 1980
Uchebnik verkhovoi ezdy. Moscow: Progress.

Polosmak N.V., Bogdanov E.S. 2015
Kurgany Sutszukte (Noin-Ula, Mongoliya), pt. 1. Novosibirsk: Infolio.

Polosmak N.V., Bogdanov E.S., Tseveendorj D. 2011
Dvadtsatyi Noin-Ulinskiy kurgan. Novosibirsk: Infolio.

Polosmak N.V., Bogdanov E.S., Tseveendorj D. 2013
The Suzukteh mound 22, Mongolia: The burial rite. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 41 (4): 102–118.

Rudenko S.I. 1948
Vtoroi Pazyrykskiy kurgan. Leningrad: Izd. Gos. Ermitazha.

Rudenko S.I. 1953
Kultura naseleniya Gornogo Altaya v skifskoye vremya. Moscow, Leningrad: Izd. AN SSSR.

Rudenko S.I. 1960
Kultura naseleniya Tsentralnogo Altaya v skifskoe vremya. Moscow, Leningrad: Izd. AN SSSR.

Savinov D.G. 1977
Iz istorii ubranstva verkhovogo konya u narodov Yuzhnoi Sibiri (II tysyacheletiye n.e.). *Sovetskaya etnografiya*, No. 1: 31–48.

Savinov D.G. 1984
Narody Yuzhnoi Sibiri v drevnetyurkskuyu epokhu. Leningrad: Izd. Leningr. Gos. Univ.

Savinov D.G. 2005
Paradnye sedla s geraldicheskimi izobrazheniyami zhivotnykh. In *Arkheologiya Yuzhnoi Sibiri*, iss. 23. Kemerovo: Kuzbassvuzizdat, pp. 19–24.

Soyonov V.I., Konstantinova E.A. 2013
Derevoobrabatyvayushchiye instrumenty iz mogilnika Verkh-Uimon (Altai). *Teoriya i praktika arkheologicheskikh issledovaniy*, No. 2: 42–57.

Stepanova E.V. 2006
Evolyutsiya konskogo snaryazheniya i otnositelnaya khronologiya pamyatnikov pazyrykskoi kultury. *Arkheologicheskiye vesti*, No. 13: 102–150.

Stepanova E.V. 2012

Konskoye snaryazheniye kochevnikov Altaya skifskogo vremeni (po materialam kurganov pazyrykskoi kultury). In *Kochevniki Evrazii na puti k imperii: Katalog vystavki*. St. Peterburg: Slaviya, pp. 103–110.

Stepanova E.V. 2014

Kitaiskiye sedla III v. do n.e. – III v. n.e. In *Trudy IV (XX) Vseros. arkheol. syezda v Kazani*, vol. IV, pp. 235–240.

Tishkin A.A. 2005

Otchet o provedenii arkheologicheskikh issledovaniy v Ongudaiskom raione Respubliki Altai i v Pervomaiskom raione Altaiskogo kraya letom i osenyu 2003 goda. Barnaul, 2005. *Arkhiv Muzeya arkheologii i etnografii Altaiskogo gosudarstvennogo universiteta*, No. 220.

Tishkin A.A. 2011

Derevyannye nakhodki iz pamyatnika Yaloman-II na Altae. In *Teoriya i praktika arkheologicheskikh issledovaniy*, iss. 6. Barnaul: Izd. Altaisk. Gos. Univ., pp. 165–176.

Tishkin A.A., Gorbunov V.V. 2003

Issledovaniya pogrebalno-pominalnykh pamyatnikov kochevnikov v Tsentralnom Altae. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. IX, pt. I. Novosibirsk: Izd. IAE SO RAN, pp. 488–493.

Tishkin A.A., Mylnikov V.P. 2007

Nachalo izucheniya kompleksa derevyannykh izdeliy bulan-kobinskoi kultury Altaya. In *Altae-Sayanskaya gornaya strana i istoriya osvoeniya ee kochevnikami*. Barnaul: Izd. Altaisk. Gos. Univ., pp. 159–165.

Tishkin A.A., Mylnikov V.P. 2008

Wooden artifacts from Yaloman II mound 31, the Altai. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 1 (33): 93–102.

Tkachenko I.D. 2003

Upryazh i sbruya. In *Sistema nauchnogo opisaniya muzeinogo predmeta: Klassifikatsiya. Metodika. Terminologiya: Spravochnik*. St. Petersburg: Art-Lyuks, pp. 93–122.

Tkachenko I.D. 2009

Snaryazheniye verkhovogo konya u kochevnikov Sibiri i Tsentralnoi Azii (opyt istoriko-etnograficheskogo issledovaniya). Cand. Sc. (History) Dissertation. St. Petersburg.

Vainshtein S.I., Kryukov M.V. 1984

Sedlo i stremya. *Sovetskaya arkheologiya*, No. 6: 114–130.

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A Scythian Age Sword from the Forest-Steppe Altai*

In 2008, a long iron sword dating to the Scythian Age was found near Klyuchi village, northern Altai. It has a kidney-shaped guard, and a pommel sculptured as two griffin-heads and decorated with gold. The grip is braided with gold wire. The archaic designs of the guard and the grip, as well as the zoomorphic pommel, suggest that the sword is no later than the 6th–early 5th centuries BC. The lifelike way of rendering griffin-heads evidently originated somewhat earlier in the east of the Scythian world than in the west, where imitations of them with claw-shaped pommels circulated from the 5th–4th centuries BC onward. A large series of Scythian Age swords and daggers, found accidentally, comes from the forest-steppe Altai. Many of them have broken or bent blades, implying that they had ritual functions. Three more long iron swords dating to the early Scythian Age were found in the south of the Ob-Irtysh watershed. Because prestigious weapons of that type are more numerous in those regions than elsewhere, they probably originated in an area that included the northern Altai as its easternmost part.

Keywords: *Swords, Scythian Age, pommel, guard, griffin.*

In summer 2008, a local citizen of the village of Klyuchi, Tyumentsevsky District of the Altai Territory, found a long iron sword of the early Scythian Age that was added to the collection of similar artifacts from the Ob-Irtysh watershed (Fig. 1). Klyuchi is situated in the easternmost part of the area where swords of this sort have occurred. This new find makes it possible to re-address the questions of the distribution and dating of such artifacts.

In summer 2009, we visited the place of discovery of the sword; it was a ploughed field 2 km northeast of Klyuchi, at the border between the Tyumentsevsky and Kamensky districts of the Altai Territory. The finder pointed to an approximate place of discovery of 100 × 200 m in size. This area is located at the northern toe of the watershed separating the Medvedka River from the wide valley (with depressions from fresh and salt water lakes) of an ancient flow. 200 m north of this place, there passes the motorway connecting Tyumentsevo and Kamen-na-Obi and adjoining the Kulunda irrigation channel. It is likely that in the late 20th century, this arable field was often levelled by bulldozers to establish mechanical irrigation systems. 12 km to the southwest, in similar environmental conditions, clusters of burial mounds of Gryaznovo-1–4 are located where the early Iron Age and medieval mounds were excavated (Mogilnikov et al., 1980). Thus, the possibility cannot be ruled out that there were burial mounds in this area that have not survived to the present day.

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Fig. 1. Swords with kidney- and heart-shaped guards from the Altai Territory.
1, *2* – Klyuchi village, Tyumentsevsky District; *3* – Novoobinka village, Petropavlovsky District; *4* – Gorkovskoye village, Shipunovsky District. *1–3* – iron, gold; *4* – iron.

The place of discovery of the sword presents a plain area with a slight slope towards the north. To the east and west, there are two dry spring beds joining Lake Gorkoye 500 m northwards. That is why it is impossible to associate the find with any particular archaeological context.

The Klyuchi sword is made of iron. Its grip is braided with gold wire and coated with gold leaf. The double-edged blade is narrowed towards the tip; the end is broken off. The preserved part of the sword is 86 cm long. The blade is 6.4 cm wide close to the guard, and 5.3 cm at the broken tip. The blade has a flat, rhomboid cross-section with a maximum thickness of 0.6 mm (Fig. 1, *1*, *2*).

The sword was found with a bent blade that was subsequently straightened by the finder. The sword does not demonstrate any of the scratches or splits that are characteristic of objects recovered from ploughed fields. Oxidation at the place of breakage suggests that the blade was broken in antiquity. Signs of damage in the blade's bending area show a pack of exfoliated plates (Fig. 2, *1*). It looks as if the blade was made of at least three plates that were apparently badly welded.

The sword has a wide kidney-shaped guard (Fig. 3). The guard was made of two separate plates: a flat plate, and a plate with a complex segment-shaped cross-section. A slot for adjusting the guard to the grip was made in the middle of the convex side of the guard. Upon setting the guard and forged welding the plates, a clearance was formed between the end of the slot and the grip (Fig. 4, *1*).

The grip is threefold and is braided with gold wire of angular cross-section, the wire edge being on the exterior surface (see Fig. 3). The braided wire is partially missing. Some wire portion was removed by the finder.

Fig. 2. Damage-signs on blades (packs of exfoliated plates) of Klyuchi (*1*) and Novoobinka (*2*) swords.

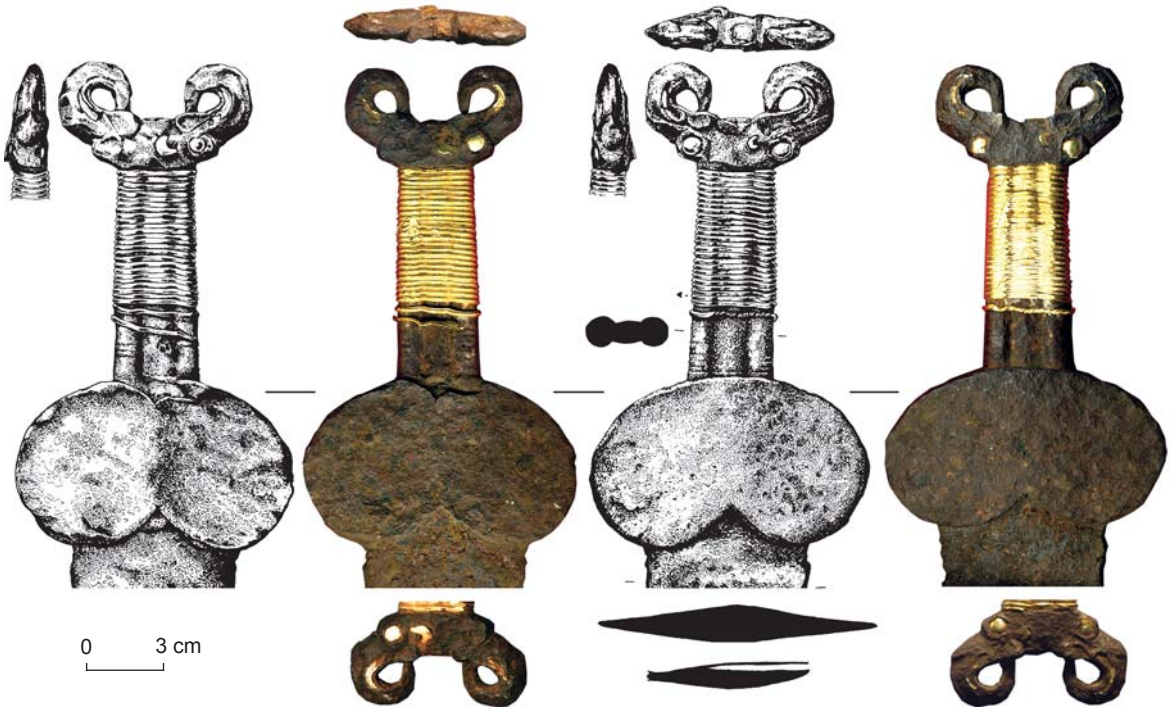

Fig. 3. Grip of the Klyuchi sword. Iron, gold.

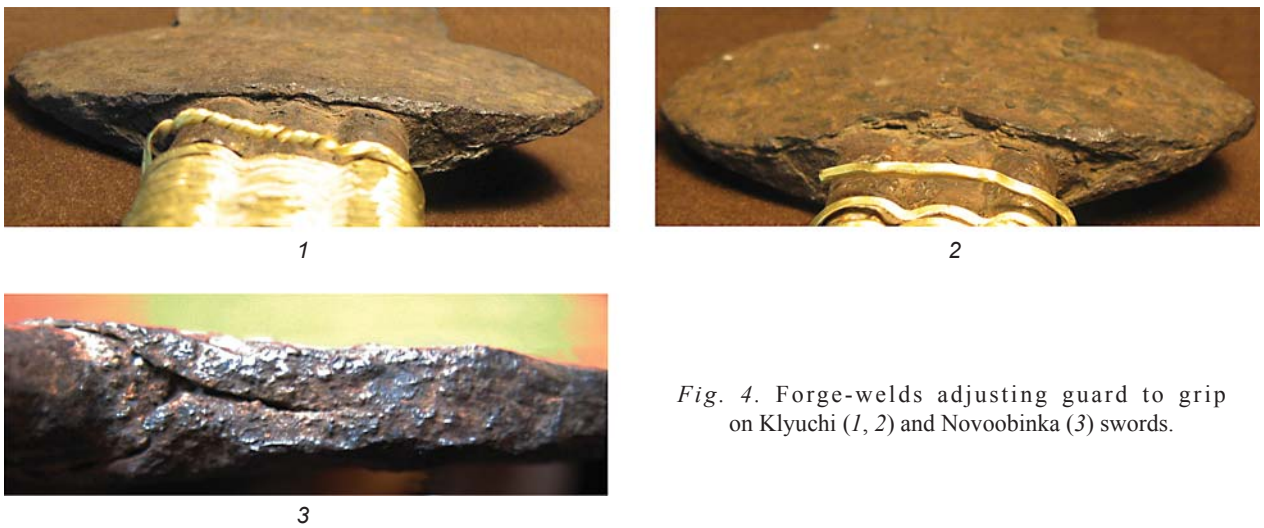

Fig. 4. Forge-welds adjusting guard to grip on Klyuchi (*1*, *2*) and Novoobinka (*3*) swords.

The pommel was sculptured as two griffin-heads facing opposite ways. The griffin's image shows a coiled beak with a cere, a large round eye, and an "ear" that represents a traditional feature of images of fantastic predatory birds in the Scytho-Siberian art. The griffins' eyes, "ears", and beaks were coated with gold leaf (see Fig. 3). Some portions of gold leaf are missing, and some parts of the pommel show signs of oxidization. The pommel was manufactured as a separate piece and hafted onto the rod-like projection of the grip with a sub-rectangular cross-section.

Despite the fact that long swords with kidney- and heart-shaped guards are rare, three similar objects have been found in the southern part of the Ob-Irtysh watershed: in the vicinity of the villages of Novoobinka, Petropavlovsky District of the Altai Territory (Ivanov, Mednikova, 1982; Mogilnikov, 1997: 39–40, fig. 33, *5*), Gorkovskoye, Shipunovsky District of the Altai Territory (Kiryushin, Ivanov, Borodayev, 1995: 99–100, fig. 1, *1*; Mogilnikov, 1997: 45, fig. 39, *1*), and Zevakino in the East-Kazakhstan Region, the Republic of Kazakhstan (incidental finds) (Mogilnikov, 1997: 41)

(see Fig. 1, *2*, *3*; 5). These swords share common features with the Klyuchi sword in the shaping of guards and grips, and also in the techniques of blade-manufacture and attachment of the elements to the grip. The closest similarity is shown by the Novoobinka sword: its cutting edge was also made from a pack of plates, as evidenced by its exfoliated blade (see Fig. 2, *2*). The guard is made of two plates, one of which has an elaborated slot on the interior surface, as on the Klyuchi sword (see Fig. 4, *3*). In general, the design of the guards and grips is similar, yet the pommels vary in shape: the Novoobinka sword has a bar-shaped pommel, the Gorkovskoye sword has a crescent-shaped pommel, the Zevakino sword has a figured pommel with images of animal-heads showing open-mouthed bare teeth, with the general outline close to bar-shaped (see Fig. 5).

Noteworthy are the archaic features in the design of swords' grips from the Ob-Irtysh watershed: kidney- or heart-shaped guard, three-fold grip, and presence of loops or orifices for sword-knot (see Fig. 5, *1*, *2*). Such features were typical of the period of the 7th–early 5th century BC (Smirnov, 1961: 12, 16; Chernenko, 1980: 12–13; Denisov, Myshkin, 2008: 67, 68; Skripkin, 2007: 44–45). Comparatively few long swords with kidney-or heart-shaped guard and three-fold grip have been reported from quite a vast territory: two swords have been found in Saka burials of Tagisken cemetery in the Aral Sea region (Itina, Yablonsky, 1997: Fig. 44, *5*; 55, *9*); several swords have been reported from the Trans-Urals and from the Volga region (Smirnov, 1961: 23; Gorbunov, Ismagilov, 1976: 235–236, fig. 1, 2; Skripkin, 2007: 44–45, fig. 1, *7*; 2, *12*; Denisov, Myshkin, 2008: Fig. 2, *2*); two, in the Scythian forest-steppe zone (Grishintsy and Chuguev settlements) (Ilyinskaya, 1968: 88–89, pl. I, 1; Ginters, 1928: 42, Taf. 19, f; Smirnov, 1961: 23); two more, in Transcaucasia (Karmir-Blur) and Central Anatolia (Imirler) (Ünal, 1982: Abb. 1, *1*; Terenozhkin, 1975: 28, fig. 20; Ivanchik, 2001: 42, 59, 60, fig. 19, *1*). Long swords from the well-dated assemblages have been attributed to the 7th century BC (Imirler, Karmir-Blur) (Ünal, 1982: 81; Terenozhkin, 1975: 28; Ivanchik, 2001: 42, 59, 60); to the 7th–6th century BC (Tagisken, mound 58); and to the 6th–early 5th century BC (Tagisken, mound 53) (Itina, Yablonsky, 1997: 67–69).

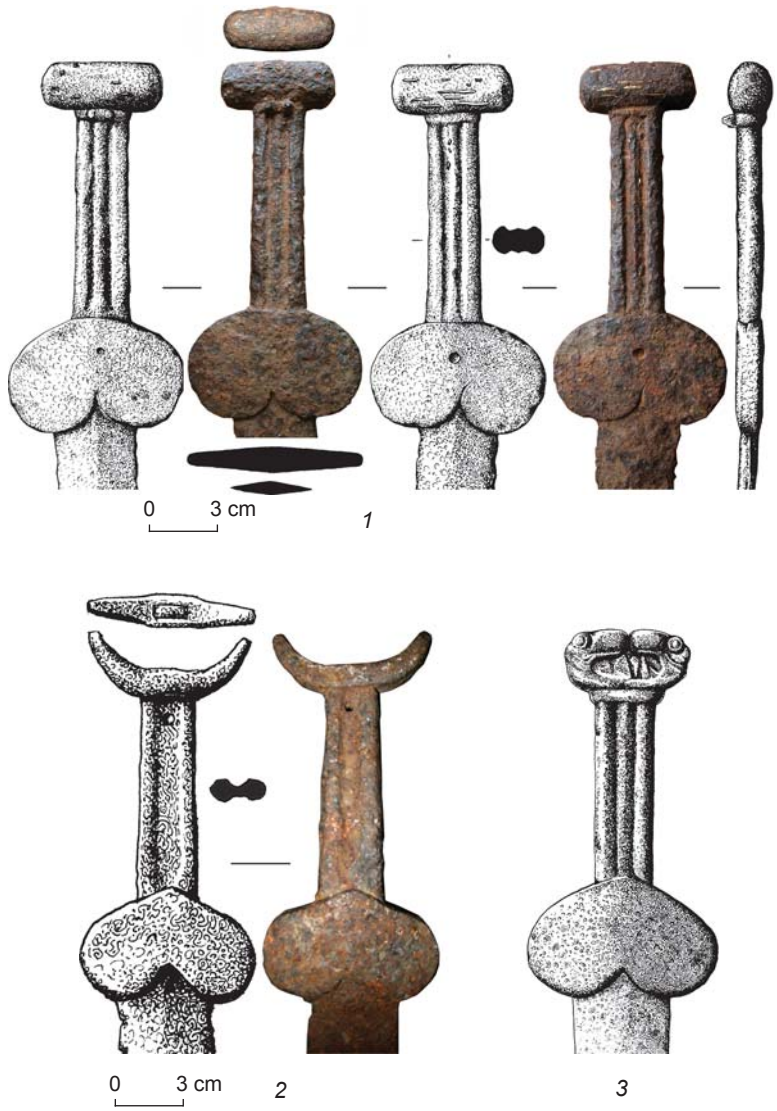

Fig. 5. Grips of iron swords.
1 – Novoobinka village, Petropavlovsky District, Altai Territory; *2* – Gorkovskoye village, Shipunovsky District, Altai Territory; *3* – Zevakino, East-Kazakhstan Region, the Republic of Kazakhstan (drawing from a photograph).

The Ob-Irtysh series of four long swords (relating to the early Scythian Age) is comparatively large and testifies that this region represents the easternmost part of the territory where such swords were generally used. These swords demonstrate archaic features, in contrast to the swords for the western parts of Eurasia steppes.

It should be noted that the southern part of the Ob-Irtysh watershed belongs to the area that yielded a large series of the Scythian bladed weapons represented mostly by accidental finds (Ivanov, 1987: 15–17; Mogilnikov, 1997: 36). Researchers believe that this is connected with the traditions of using swords and daggers for ritual purposes and with existence of cult places (Borodovsky, Larichev, 2001: 226; Pletneva, Mets, 1999: 145; Vasiliev,

Obydennov, 1994: 98). Perhaps this is also attested by the damage-signs on these objects. The blades of all Scythian long swords from the Altai forest steppe (Klyuchi, Novoobinka, Gorkovskoye) were bent in ancient times, which suggests some ritual activities.

A wide range of analogs is available for the zoomorphic pommel of the Klyuchi sword. The closest is the pommel of the iron dagger from Barnaul Region, representing two opposing griffin-heads (Mogilnikov, 1997: 42, fig. 36, *2*). The easternmost analog is the pommel of the bronze dagger discovered in Northern China in the burial at Beixinbao cemetery in Hebei Province (Fig. 6, *4*). The "ge" pick found in this burial allowed the dagger to be dated to the 5th–early 4th century BC (Jung Sok Bae, 1998: 25, fig. 1, *5*).

Pommels with stylized images of griffin-heads, which are usually designated as "claw-shaped", are most typical for the regions west of Southern Siberia (Ismagilov, Skarbovenko, 1977: 90; Denisov, Myshkin, 2008: 65). Sword and dagger pommels from Bashkiria (Vasiliev, Obydennov, 1994: 96, fig. 1, *3*) and Solovka in Orenburg Region (Smirnov, 1961: 39–40, fig. 4, *1*) are the closest analogs in the design of griffin-heads to the Ob-Irtysh objects (Fig. 6, *5*). Some researchers believe that the pommels showing lifelike images of griffin-heads represent the Siberian tradition (Ibid.: 20; Vasiliev, 2001: 41). In general, swords and daggers with claw-shaped pommels were widespread in the western part of the Scythian realm. The majority of researchers attribute them to the 5th–4th century BC (Ismagilov, Skarbovenko, 1977: 90; Maksimov, Polesskikh, 1971: 241–242; Smirnov, 1961: 21; Vasiliev, Obydennov, 1994: 96; Milyukova, 1964: 55–56, pl. 20, *8–11*; Ilyinskaya, 1968: 90, pl. VII, 18; XV, 1). Notably, only a few such objects have been recorded in Siberia. For instance, a long iron sword with a bronze grip was found in Yakutia and represents the northeasternmost find of this sort. The fact that this sword was found in such a distant place from the dispersal area of Scythian cultures arouses considerable interest (Okladnikov, 1955: 190–191, fig. 64, *2*).

The claw-shaped pommels were interpreted as stylized images of griffin-heads by A.A. Bobrinsky, A.A. Miller, V.A. Grakov, and V.A. Ilyinskaya (Merpert, 1948: 76; Ilyinskaya 1968: 90). N.Y. Merpert (1948: 77–78) proposed the "claw-shaped" interpretation of this pommel type. This interpretation has been accepted by the majority of researchers nowadays (Denisov, Myshkin, 2008: 65). Merpert based his interpretation on the longitudinal division of the "antennas" resembling the claw structure, and on the absence of more "realistic" prototypes of the stylized images where griffin-heads could be clearly seen (1948: 75–76). The design of the Klyuchi pommel confutes these arguments in favor of interpretation of such stylized images exactly as "claw-shaped" and not "griffin-headed".

Apparently, the "classical" representation of the eared griffin-head suggests the earlier origin of the sword as compared to the specimens decorated with stylized images. Substantially, this representation can be considered a prototype of subsequent images that were transformed into "antenna-shaped", "claw-shaped", and "claw-shaped" with a guard type of pommel. The indication of an eye and a loop-shaped beak-claw on claw-shaped pommels attests to the fact that such pommels probably were the stylized derivatives of "griffin-headed" ones. The wrinkles (longitudinal folds) on the "antenna"-

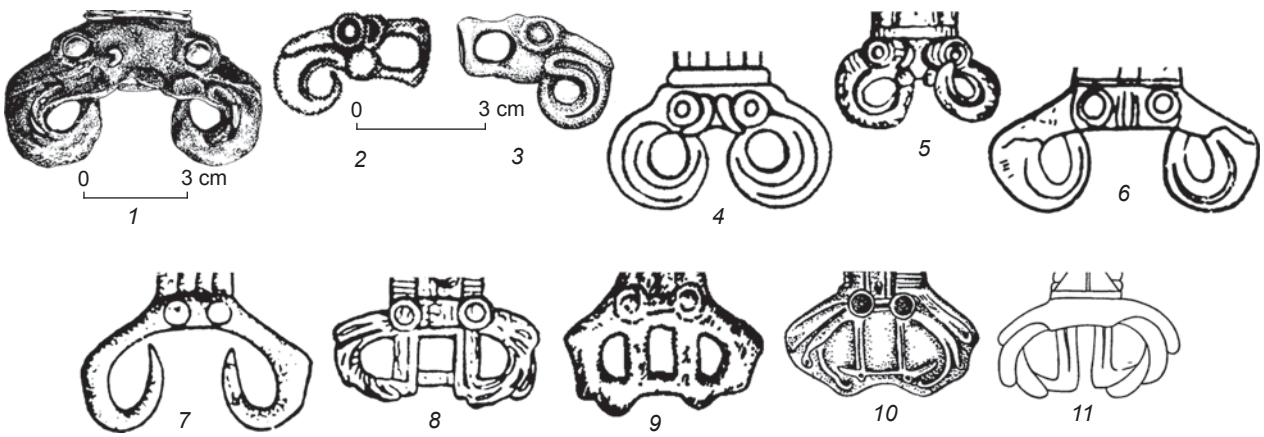

Fig. 6. Sword-pommels and horse-trappings of the Scythian Age, showing griffin-head images, and their stylized variants.
1 – Klyuchi village, Altai Territory; *2* – Kyryk-Oba II, Southern Transurals (after: (Gutsalov, 2007: Fig. 12, III, *8*)); *3* – Obskiye Plesy II, Altai Territory (after: (Vedyanin, Kungurov, 1996: Fig. 16, *9*)); *4* – Beixinbao, Hebei Province (after: (Jung Sok Bae, 1998: Fig. 1, *5*)); *5* – Solovka, Orenburg Region (after: (Smirnov, 1961: Fig. 4, *1*)); *6* – Grishchintsy, Cherkassy Region (after: (Milyukova, 1964: Pl. 20, *10*)); *7* – Ekaterinoslav Governorate (after: (Ibid.)); *8* – Novaya Bogdanovka, Orenburg Region (after: (Denisov, Myshkin, 2008: Fig. 4, *6*)); *9* – Staikin Verkh, the Sula River basin (after: (Ilyinskaya, 1968: Pl. VII, 18)); *10* – Aksyutintsy, Sumy Region (after: (Ibid.: Pl. XV, 1)); *11* – Kirensk on the Lena River, Yakutia (after: (Okladnikov, 1955: Fig. 64, *2*)).

beak most likely imitate the cere feature that is typical of the "classical" images of beaks of predatory birds and griffins (Fig. 6). It should be noted that all the above-mentioned analogs to the image on the Klyuchi sword pommel already show stylized features: the "ear" is missing, cere is shown through a dimple. Recognizable are only the eye and the beak (Fig. 6, *4–6*).

The Klyuchi sword's pommel shows all features typical of the iconography of an eared griffin-head: a large round eye, brackets behind it, arched "ears", and a coiled beak with an emphasized cere (Fig. 6, *1*). This representation has a great number of analogs among the objects made in the Scytho-Siberian animal style from sites of southern Siberia (Chlenova, 1967: Pl. 26; Shulga, 2002: 186–189). For instance, a clear resemblance was noted to the iconography of griffin-heads on bronze belt-clips from the cemeteries of Obskiye Plesy II (Barnaul region of the Ob) and Kyryk-Oba II (Southern Transurals) (Fig. 6, *2*, *3*) and also on butterfly-shaped plaques from the cemetery of Firsovo XIV (Vedyanin, Kungurov, 1996: Fig. 16, *3*, *9*; Gutsalov, 2007: Fig. 12, *8*; Frolov, 2008: Fig. 133, *3*; 186, *1*, *5*).

The archaic design of the guard and the grip, and also the pommel in the form of griffin-heads, suggest that the sword is no later than the 6th–early 5th centuries BC. The lifelike way of rendering griffin-heads may suggest that such swords originated in the east of the Scythian world somewhat earlier than in the west, where their imitations with stylized pommels circulated from the 5th–4th centuries BC onward.

References

Borodovsky A.P., Larichev V.E. 2001
Iyusskiy kinzhal i voprosy interpretatsii kladov vtoroi poloviny I tys. do n.e. na yuge Zapadnoi Sibiri. In *Prostranstvo kultury v arkheologo-etnograficheskom izmerenii: Zapadnaya Sibir i sopredelnye territorii*. Tomsk: Izd. Tomsk. Gos. Univ., pp. 224–227.

Chernenko E.V. 1980
Drevneishiye skifskiye paradnye mechi (Melgunov i Kelermess). In *Skifiya i Kavkaz*. Kiev: Nauk. dumka, pp. 7–30.

Chlenova N.L. 1967
Proiskhozhdeniye i rannyaya istoriya plemen tagarskoi kultury. Moscow: Nauka.

Denisov A.V., Myshkin V.N. 2008
Klinkovoye oruzhiye kochevogo naseleniya basseyna reki Samary v VII–IV vv. do n.e. *Nizhnevolzhsky arkheologichesky vestnik*, iss. 9: 62–75.

Frolov Y.V. 2008
Pogrebalnyi obryad naseleniya Barnaulskogo Priobya v VI v. do n.e. – II v. n.e. (po dannym gruntovykh mogilnikov). Barnaul: Azbuka.

Ginters W. 1928
Das Schwert der Skythen und Sarmaten in Südrussland. Berlin: Verl. von Walter de Gruyter & Co.

Gorbunov V.S., Ismagilov R.B. 1976
Novye nakhodki mechei i kinzhalov savromato-sarmatskogo vremeni iz Bashkirii. *Sovetskaya arkheologiya*, No. 3: 229–247.

Gutsalov S.Y. 2007
Burials of the nomadic elite in the South Ural region (mid-1st millennium BC). *Archaeology, Ethnology and Anthropology of Eurasia*, No. 2 (30): 75–92.

Ilyinskaya V.A. 1968
Skify dneprovskogo lesostepnogo levoberezhya (kurgany Posulya). Kiev: Nauk. dumka.

Ismagilov R.B., Skarbovenko V.A. 1977
Novye nakhodki savromatskogo oruzhiya v mezhdurechye Volgi i Urala. In *Srednevolzhskaya arkheologicheskaya ekspeditsiya*. Kuibyshev: Kuibyshev. Gos. Univ., pp. 77–92.

Itina M.A., Yablonsky L.T. 1997
Saki nizhnei Syrdaryi. Moscow: ROSSPEN.

Ivanchik A.I. 2001
Kimmeriytsy i skify: Kulturno-istoricheskiye i khronologicheskiye problemy arkheologii vostochnoevropeiskikh stepei i Kavkaza pred- i ranneskifskogo vremeni. Moscow: Poliograf. (Stepnye narody Evrazii; vol. II).

Ivanov G.E. 1987
Vooruzheniye plemen lesostepnogo Altaya v rannem zheleznom veke. In *Voyennoye delo drevnego naseleniya Severnoi Azii*. Novosibirsk: Nauka, pp. 6–27.

Ivanov G.E., Mednikova E.M. 1982
Novoobinskiy kurgan. In *Arkheologiya i etnografiya Altaya*. Barnaul: Altaisk. Gos. Univ., pp. 89–95.

Jung Sok Bae. 1998
Kinzhaly epokhi rannego zheleza iz Severnogo Kitaya. In *Antichnaya tsivilizatsiya i varvarskiy mir: (Materialy 6 arkheol. seminara)*, pt. 1. Krasnodar. Gos. akademiya kultury. Krasnodar: pp. 23–29.

Kiryushin Y.F., Ivanov G.E., Borodayev V.B. 1995
Mechi iz sobraniya Shipunovskogo muzea. In *Problemy okhrany, izucheniya i ispolzovaniya kulturnogo naslediya Altaya*. Barnaul: Izd. Altaisk. Gos. Univ., pp. 99–103.

Maksimov E.K., Polesskikh M.R. 1971
Zametka ob akinakakh. *Sovetskaya arkheologiya*, No. 2: 238–242.

Merpert N.Y. 1948
Akinak s kogtevidnym navershiyem. *KSIIMK*, iss. XXII: 74–79.

Milyukova A.I. 1964
Vooruzheniye skifov. Moscow: Nauka. (SAI; iss. D1-14).

Mogilnikov V.A. 1997
Naseleniye Verkhnego Priobya v seredine–vtoroi polovine I tysyacheletiya do n.e. Moscow: IA RAN.

Mogilnikov V.A., Neverov S.V., Umansky A.P., Shemyakina A.S. 1980
Kurgany u derevni Gryaznovo. In *Drevnyaya istoriya Altaya*. Barnaul: Altaisk. Gos. Univ., pp. 106–130.

Okladnikov A.P. 1955
Yakutiya do prisoyedineniya k Russkomu gosudarstvu. In *Istoriya Yakutskoi ASSR*, vol. 1. Moscow, Leningrad: Izd. AN SSSR.

Pletneva L.M., Mets F.I. 1999
Ritualnyi kompleks rannego zheleznogo veka v Tomskom Priobye. In *Itogi izucheniya skifskoi epokhi Altaya i sopredelnykh territorii*. Barnaul: Izd. Altaisk. Gos. Univ., p. 145.

Shulga P.I. 2002

O stilizovannykh obrazakh orla i grifona VII–IV vv. do n.e. v Yuzhnoi Sibiri. In *Istoriya i kultura Vostoka Azii*, vol. II. Novosibirsk: Izd. IAE SO RAN, pp. 186–191.

Skripkin A.S. 2007

Klinkovoye oruzhiye rannikh kochevnikov Nizhnego Povolzhya VII–IV vv. do n.e. In *Vooruzheniye sarmatov: Regionalnaya tipologiya i khronologiya: Sbornik dokl. i materialov VI Mezhdunar. konf. "Problemy sarmatskoi arkheologii i istorii"*. Chelyabinsk: pp. 38–50.

Smirnov K.F. 1961

Vooruzheniye savromatov. Moscow: Izd. AN SSSR. (MIA; No. 101).

Terenozhkin A.I. 1975

Kimmeriyskiye mechi i kinzhaly. In *Skifskiy mir*. Kiev: Nauk. dumka, pp. 3–34.

Ünal V. 1982

Zwei Gräber eurasischer Reiternomaden im nördlichen Zentralanatolien. In *Beiträge zur allgemeinen und vergleichenden Archäologie*, Bd. 4. München: C.H. Beck'sche Verlagsbuchh, pp. 65–81.

Vasiliev V.N. 2001

Vooruzheniye i voyennoye delo kochevnikov Yuzhnogo Urala v VI–II vv. do nashei ery. Ufa: Gilem.

Vasiliev V.N., Obydennov M.F. 1994

Kinzhaly predsavromatskogo i savromatskogo vremeni iz Bashkirii. In *Vooruzheniye i voyennoye delo drevnikh plemen Yuzhnogo Urala*. Ufa: Konkord-Invest, pp. 95–99.

Vedyanin S.D., Kungurov A.L. 1996

Gruntovyi mogilnik staroaleiskoi kultury Obskiye Plesy 2. In *Pogrebalnyi obryad drevnikh plemen Altaya*. Barnaul: Izd. Altaisk. Gos. Univ., pp. 88–114.

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Above-Ground Frame Buildings in Western Siberia: Archaeological and Ethnographic Parallels

This study examines above-ground frame buildings and their numerous parallels in various cultures. In Western Siberia, these structures occur throughout the area from the forest-steppe to the northern taiga and over a time span from the Chalcolithic to the Middle Ages. They were especially popular during the Bronze to Iron Age transition. In settlements, remains of these buildings usually look like oval or rounded areas raised above the ground and surrounded by shallow pits or ditches and sometimes by low earthen mounds. Recent ethnographic studies among the Selkups of the Upper Taz River, Krasnoselkupsky District, Yamal-Nenets Autonomous Okrug, demonstrate that the natives of the northern taiga have been using such constructions until the present time. These frame dwellings, shaped like truncated pyramids, had no foundation pits, and were covered with sand and turf. They were called poy-mat, which means "wooden house" in Selkup. Poy-mat was a seasonal dwelling that, in the 20th century, was used by hunters and poor reindeer herders in the winter. Our findings reveal parallels between Selkup and archaeological dwellings and allow us to reconstruct the appearance of ancient buildings, their construction, materials, and usage. This type of building had several adaptive advantages that contributed to its viability over the centuries.

Keywords: *Ethno-archaeology, Western Siberia, Selkups, above-ground buildings.*

Introduction

Buildings of the above-ground type are found in Western Siberia in the archaeological cultures of various periods: the Chalcolithic, the Late Bronze Age, the Early Iron Age, and the Middle Ages (Fig. 1). We use the term "above-ground buildings" to refer to post-frame structures without a foundation pit, built on the ancient daylight surface. Currently, the remains of these structures at settlements have the form of oval or rounded areas raised above the ground, surrounded by shallow pits or ditches and sometimes by low earthen mounds. These areas are barely visible in the terrain; their height is 0.15–0.30 m, sometimes reaching 0.5–0.7 m. The areas vary from small (3 × 4 to 7 × 7 m) to larger (7 × 14 to 12 × 15 m, etc.) in size. The remains of the structures provide very little evidence for reconstructing their above-ground part and interior space. The presence and location of beams and holes from the posts, as well as their mutual arrangement and some other features, often suggest a frame or post-frame structure in the shape of a pyramid / truncated pyramid. Sometimes these objects show a small quantity of finds in the cultural layer, which may suggest that some of the structures served as seasonal dwellings (Ocherki…, 1994: 284, 300, etc.; Chemyakin, Karacharov, 2002; Chemyakin, Zykov, 2004: 48–49, 53, etc.; Mikhalev, Korusenko, 2007; Zimina, Zakh, 2009; and others).

In most cases, the task of identifying the house-building traditions of ancient peoples leads us to search for parallels among ethnographic materials: the types of

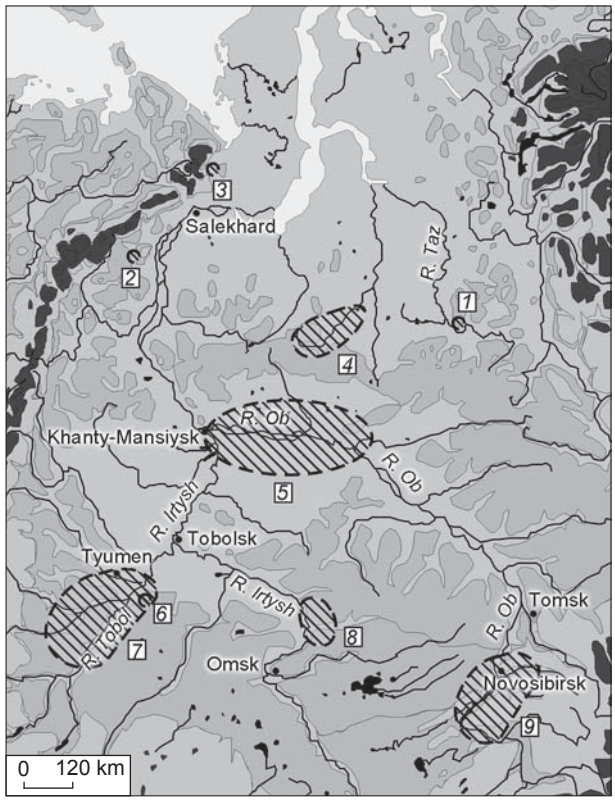


Fig. 1. Areas of Western Siberian cultures with known above-ground buildings, and the location of Selkup abandoned dwellings of the 20th century.
1 – present day; *2*, *8*, *9* – the Middle Ages; *3–5*, *7* – the Late Bronze–Early Iron Ages; *6* – the Chalcolithic.

buildings which existed among the indigenous peoples of Siberia. In the summer of 2013, two abandoned half-ruined Selkup dwellings of the post-frame structure, covered with sand and turf (Fig. 2) were found in the vicinity of the village of Kikki-Akki (the upper reaches of the Taz River) in Krasnoselkupsky District of the Yamal-Nenets Autonomous Okrug during the work of an archaeological and ethnographic expedition arranged by the Institute of Northern Development of SB RAS. The remains were similar to frame dwellings of the truncated pyramid type according to the typology of the ethnologist Z.P. Sokolova who specializes in Siberian cultures (1998: 137–138). The appearance of the discovered structures, their state in the process of "archaeologization", and the opportunity to speak with their owners suggested the idea for considering the above-ground buildings from a broader historical perspective. A.V. Kenig, who conducted his ethno-archaeological studies in the same Krasnoselkupsky District, emphasized that "studying the processes of archaeologization at functioning or recently abandoned settlements is an important source of information for creating archaeological reconstructions" (2001: 60).

Archaeological materials

Western Siberian buildings can be categorized in accordance with the depth of the foundation pit. There are some differences in classification of buildings from different periods. Thus, three building types have been identified for the Neolithic–Bronze Age: above-ground buildings (set into the ground less than 30 cm from the ancient daylight surface), half-dugout buildings (with a depth of 30–150 cm), and pit-houses (with a depth of over 150 cm) (Ocherki…, 1994: 245). The Early Iron Age structures include above-ground, semi-underground (with a depth of 20–150 cm), and underground buildings (with a depth of over 150 cm). In some cases, scholars note that "above-ground structures differ from the semi-underground structures by the lack of a foundation pit" (Ibid.: 299–300); in other instances, they describe buildings "with a foundation pit of slight depth (up to 25 cm)" (Ibid.: 366) as above-ground structures. In this study, we will only consider structures which are not set into the ground.

In our opinion, buildings of the above-ground type have as of yet remained understudied. The earliest of the excavated dwellings of this type were examined by V.A. Zakh at the settlement of Sredniy Baklan-1 in the subtaiga area of the Tobol region. The buildings belong to the Andreyevskoye culture and were dated to the Chalcolithic (Zakh, Fomina, 1999: 15). Such dwellings became widespread during the Bronze to Iron Age transition. The area of their distribution is the forest-steppe subzone of the northern taiga.

In the northern taiga, the structures of the above-ground type in most cases belong to the Early Iron Age (Sugmuten-Yagun VI, VII, IX, Ust-Kamchin-Yagun) or the Middle Ages (Pitlyar fortified settlement of the 6th–7th and 8th–9th centuries, Ust-Voykar settlement of the 14th century, etc.) (Kosinskaya, Fedorova, 1994: 58–59, 79–81; Istoriya…, 2010: 31, 77–78, 82–83). The settlements discovered at the Sugmuten-Yagun River (Pur River basin) and previously dated to the Early Iron Age, include from one to five dwellings ranging from 2.5 × 3.5 to 8.5 × 10.5 m in size, and surrounded by external pits around the perimeter (Kosinskaya, Fedorova, 1994: 80–81).

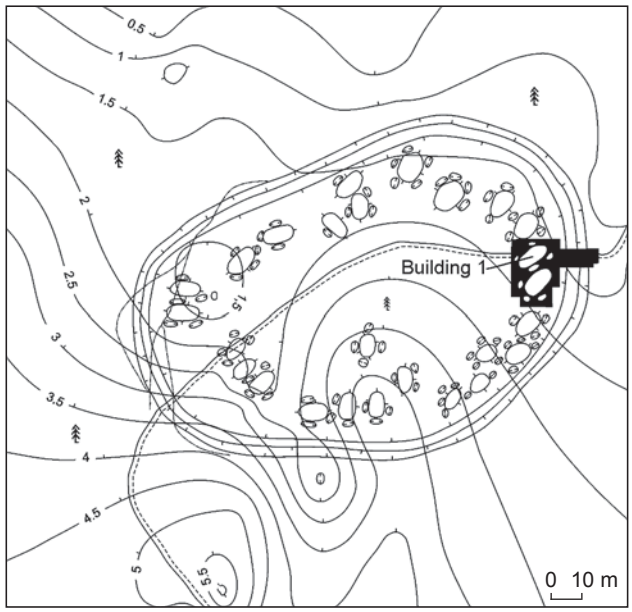
Above-ground buildings emerged in the middle taiga subzone of Western Siberia (the Surgut region of the Ob) in the Late Bronze Age (Barsov culture), and became more widespread in the Early Iron Age among the carriers of the Beloyarsky, Kalinkino, and Kulai (early phase) cultures. These dwellings constituted more extensive settlements, including fortified ones surrounded by a rampart and a ditch (Chemyakin, Zykov, 2004: 18, 25, 29, 33, 48–49).

Settlements with above-ground buildings re-emerged in the valley of the Tobol River, in the south of Western

Fig. 2. An abandoned Selkup dwelling in the upper reaches of the Taz River. Photograph by O.E. Poshekhonova, 2013.
1 – general view; *2* – fragments of the covering; *3* – interior space; *4* – joining of the structural elements.

Siberia, at the turn of the Bronze and Iron Ages. They mostly could be found in the subtaiga zone and in the coniferous forest of the forest-steppe region. In general, such structures were not typical of the house-building tradition of the Tobol region which was predominantly characterized by dwellings with foundation pits. In this area, above-ground buildings occurred in fortified settlements with circular layout belonging to the eastern version of the Itkul culture (Fig. 3; 4, *I*). These settlements comprised from 4 to 40 dwellings. Unfortified settlements comprised between 3 and 82 buildings (Zimin,

Fig. 3. Remains of the above-ground dwelling on the land. Fortified settlement of Mityushino-5 (Tyumensky District of the Tyumen Region).



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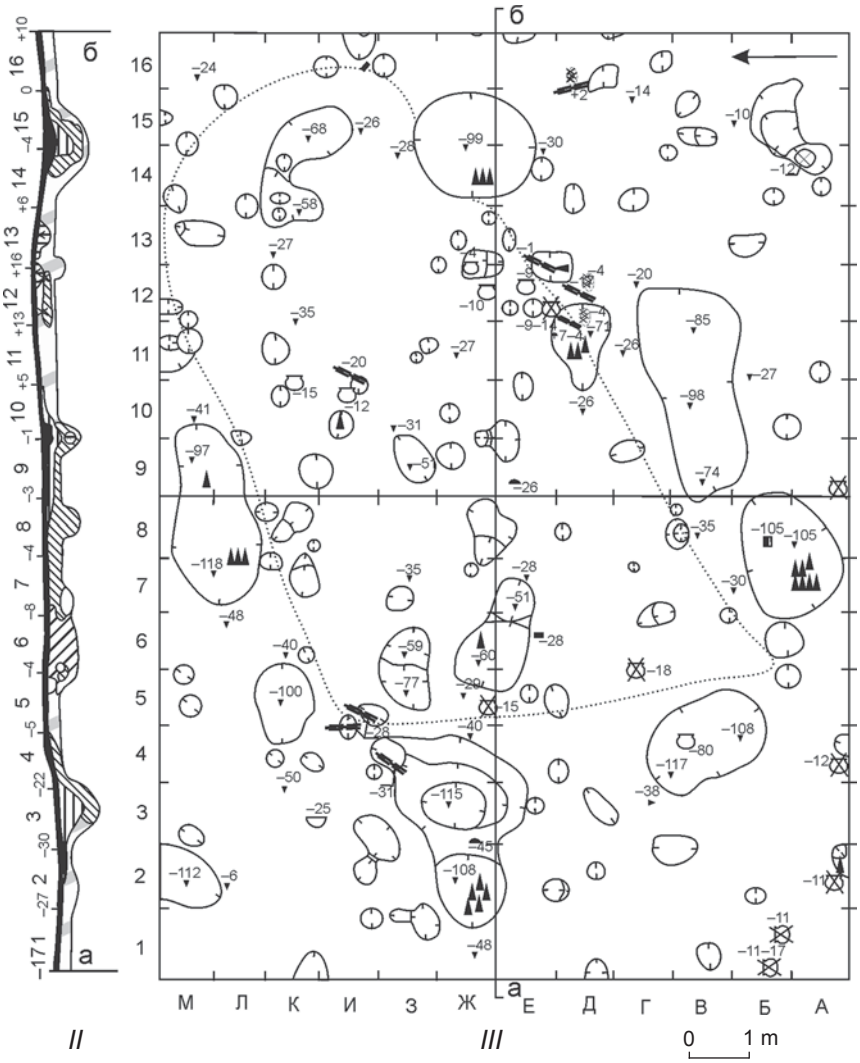

II *III*

Fig. 4. Layout plan of the fortified settlement of Karagai Aul-4 in Yarkovsky District of the Tyumen Region (*I*), stratigraphy (*II*), and the excavation plan of structure 1 of this site relative to the virgin soil (*III*).

1 – above-ground dwelling; *2* – ditch-mound; *3* – excavation; *4* – pine forest; *5* – earth road; *6* – fire trenches; *7* – turf; *8–12* – sandy loams: *8* – light brown, *9* – brown, *10* – dark brown, *11* – brown-gray, *12* – dark gray; *13* – calcination; *14* – border of the structure; *15* – bench marks; *16* – hole; *17* – coal accumulation; *18* – pieces of wood; *19* – fragments of a broken vessel; *20* – accumulation of ceramics; *21* – fragments of pottery; *22* – a stone with the traces of processing; *23* – individual fragments of ceramics; *24* – a ceramic end-scraper.

Zakh, 2009: 26–130). The remains of above-ground structures have been found much less frequently at the settlements of the Baitovskoye culture (Tsembalyuk et al., 2011).

In the Tobol region, above-ground buildings were examined at the settlements belonging to the eastern version of the Itkul culture (Karagai Aul-1, -4, Vak-Kur-2). On the land, the raised areas had the sizes from 8 × 8 to 9 × 14 m, and the height of 0.25–0.35 m. Excavations have shown that the floor of the structures was at the level of the ancient daylight surface. An amorphous pit was found near a wall in only one out of three examined buildings at the fortified settlement of Vak-Kur-2. The pit had the size of approximately 5.0 × 3.5 m, and a depth of 0.25–0.30 m. Traces of hearths in the form of spots of calcined sandy loam were located in the center of the dwelling (Karagai Aul-1) or were slightly shifted from the center (Vak-Kur-2, Karagai Aul-4); in some buildings, they were absent (Karagai Aul-1, -4). The remains of the post-frame structure could be seen on light-brown sandy loam in the form of spots of gray sandy loam, sometimes with charcoal inclusions (Fig. 5, *1*). In the virgin soil, they are manifested as holes with a diameter of 0.25–0.40 m. The boundaries of the structure are marked by the holes from the posts and large external pits around the perimeter (see Fig. 4, *II*, *III*; 5, *2*). The approximate dimensions of the structures ranged from 7.5 × 7.5 m to 8 × 11 m, occupying an area of 60–70 m^2. One building was of subtrapezoid shape in layout; its size was 5.5 × 6.0 × 6.5 × 3.0 m; the building occupied an area of about 30 m^2. The size of one structure at the settlement of Vak-Kur-2 was 12.0 × 8.5 to 10.0 m, but the location of holes from the posts suggests that the building consisted of two adjoining rooms 6 × 10 and 6 × 8 m. The external pits surrounding the structure might have had significant size (3.5 to 3.0 × 2.3 to 2.5 m) and depth (0.84–1.24 m). The soil from the pits might have been used for insulating the walls during the construction of the dwelling. Sometimes, the external pits around the buildings did not contain any finds (Karagai Aul-4, Karagai Aul-1, section A); in other cases (Vak-Kur-2, Karagai Aul-1, section B), they were filled with artifacts, mostly fragments of ceramic ware. In general, the saturation of the cultural layer at the archaeological sites of the eastern version of the Itkul culture in the early (Itkul) period was insignificant, and the layers of the later stage contained much richer finds, mostly including fragments of pottery, scrapers from the breakage of vessels, stone abraders, ceramic spindle whorls, sporadic objects of bronze-casting production (fragments of crucibles), and objects of bronze.

1

2

Fig. 5. Remains of an above-ground building in the cultural layer at a depth of 20 cm from the surface (*1*) and in the virgin soil (*2*). Structure 1 at the site of Karagai Aul-4 (Yarkovsky District of the Tyumen Region).

In the Irtysh basin and Baraba, above-ground buildings are associated with the cultures of the Middle Ages. The remains of such structures in the form of raised areas surrounded by pits have been found in some Potchevash (Cheplyarovo-26, -28, Murlinka-2, Lozhka-4) and Ust-Ishim (Alekseyevka XIII, XXVI) settlements on the lower reaches of the Tara River. The Potchevash settlements date back to the 6th–8th centuries; the Ust-Ishim settlements to the 10th–11th (13th) centuries (Baraba…, 1988: 124–129; Mikhalev, Korusenko, 2007; Mikhalev, 2008). Judging by the small size of the hearths and low embankments remaining from the mound at the bottom of the walls, scholars concluded that these dwellings were used by the medieval population of the Irtysh basin in a relatively warm season (fall?) (Mikhalev, Korusenko, 2007: 312).

In the Novosibirsk region of the Ob, above-ground frame structures (currently in the form of rectangular mounds with sides mostly measuring 6–7 m, 0.4–0.5 m

high, and pits along the edges) have been studied at the settlements of the 10th–14th centuries. These settlements are located within river terraces, and are composed of remains of a small number of structures; the cultural layer is practically absent; the finds are concentrated in the dwellings or in the pits next to them. It is believed that these settlements could have served as seasonal winter shelters (Adamov, 2000: 14–15).

Ethnographic data

Now we should turn to more detailed information from the supposed ethnographic parallels to the ancient buildings. It should be noted that the abandoned Selkup dwellings, discovered in the upper reaches of the Taz River, are quite specific because they are of the above-ground type. They are clearly distinguished from half-dugouts of similar design common among the neighboring groups of the Selkups, the Kets, and the Eastern Khanty by the lack of any significant deepening into the soil. In the Selkup language, such a structure has the name of *poy-mat*, which means "wooden house". In Russian, the Upper Taz Selkups often call it "zemlyanka" or "zasypukha"; and they consider the latter name to be more accurate, because the building is not deepened into the soil. This type of dwelling was seasonal; it was widely used in the 20th century by the owners of small deer herds and hunters without deer as winter shelters, "*Those who stay in one place—have zemlyankas. They live there near the river in the summer and in zemlyankas in the winter*" (field materials by V.N. Adayev, 2013).

Some publications contain the descriptions of *poy-mats* which were somewhat deepened into the soil (Kenig, 2010: 59–61; Irikov, 2002: 73–74). Probably, such structures without foundation pits had only local use among the Upper Taz Selkups. The conclusion of S.V. Lezova that the structure of this type of dwelling was brought to the upper reaches of the Taz River from the south (the rivers of Narym and Vakh) during the Selkup migration to the northern taiga areas in the 17th–18th centuries, seems to be entirely plausible. Simplification of the dwelling structure occurred with the transition of the Selkup population from sedentary fishery to a semi-nomadic hunting economy, namely, the dwelling pit became significantly reduced (and in some areas almost disappeared) (Lezova, 1991: 104–107). It is interesting that modern residents of the village of Kikki-Akki consider the real dugouts, or more precisely half-dugouts (*chul-mat*), well known in other areas where the Northern Selkups live, to be of non-Selkup origin and even tend to doubt the practical usefulness of such dwellings, "*The Selkups never dug zemlyankas into the ground. If you dig, there will be dampness, and you can get sick*" (field materials by V.N. Adayev, 2013). For this reason, the Selkups always interpret depressions which remained from ancient buildings and and are found near their villages as the remains of dwellings belonging to the Nenets, the people who had lived in the same area before the arrival of the Selkups.

Further information about the dwellings is based on field ethnographic materials collected during the expedition of 2013 by V.N. Adayev and O.E. Poshekhonova. The last instances of living in a *poy-mat* in the vicinity of the village of Kikki-Akki occurred in the early 2000s. One dwelling located 2 km west of the village, on a promontory of the right terrace of the river Taz, was built in 1996–1997 and was abandoned in 2001; three persons lived there (an owner and his guests practicing seasonal hunting). The second *poy-mat* which fell out of use around 1996 (the date of its building could not be established), is located 2 km north-east of Kikki-Akki, on a promontary, 50 meters from the edge of the right terrace of the Kikkeokke stream; about five people lived in the dwelling (a woman of middle age and her adult and adolescent children). The dwellings were abandoned because their owners ceased to practice seasonal hunting (in the former case) or reindeer breeding (in the latter case). In spite of significant shedding of the earth covering of the buildings and partial collapse of the structure, the elements of the wooden frame have remained firm for a long time, and according to the local residents, after repair, both dwellings may again become fully operational.

For the construction of *poy-mat*, a ground area measuring 4 × 3 m (or of proportionally larger size) was cleared of turf; four supporting posts 2.5–3.0 m high and 20–30 cm in diameter were dug into the ground at the corners of the area, slanting inwardly at an angle of about 70 degrees. Four horizontal beams were set into grooves in the upper ends of the posts (see Fig. 2, *3*, *4*), thus creating a stable frame for the dwelling in the shape of a truncated pyramid. In larger buildings, two additional posts standing straight were sometimes added for supporting the longitudinal beams in their central parts. A log (sometimes two parallel logs at a distance of about 0.5 m from each other) was laid on top of the structure in a direction from the back wall towards the door, and served as roof beams for creating the required slope of gabled roof. The resulting frame was tightly covered by split logs 20–30 cm wide (pine, Siberian cedar, birch, or larch* could have been used) around the perimeter with their split surface inside. They were set on the ground with an angle toward the dwelling, leaving an opening at the entrance. The gaps between the wood-slabs were insulated with moss; the structure was further covered with layers of birch bark or turf, "*On top, people would first cover*

*Spruce was considered an unsuitable timber species due to its insufficient hardness.

*it with turf from the "black forest"**, *the turf is thick there… If they did not have birch bark, they would cover* [the dwelling] *with turf*". Turf and moss were dug up in the immediate vicinity of the future dwelling. Small logs with three branches were placed on top of the resulting layer in such a way that three levels of parallel steps would be formed around the perimeter of the entire dwelling, upon which poles about 15 cm in diameter were laid. The posts were intended to support a small mound of sand 15–20 cm thick, which completed the covering of the dwelling. Sand for the mound was also obtained from the immediate vicinity of the building, thus leading to the emergence of a chain of small depressions (holes and ditches) around the perimeter of the dwelling. The roof was covered with the same materials and in the same sequence; a square hole (approximately 0.5 × 0.5 m) for the chimney was left in the center of the roof. The height of the dwelling from the floor to the ceiling in the central part reached about 1.8–1.9 m.

A small adobe open fire stove (widely known in Western Siberia as a *chuval*) was made in the center for heating the dwelling. The base for the stove was often an old dugout boat of cedar pine or aspen, which was sawn crosswise, and the halves were placed together to form a cavity inside. The method of making such a type of stove is described by a local resident as follows, "*People would fold the boat, saw off the bow, then the whole thing would be daubed with clay. They would place it in the center under the hole in the roof, and made a fire inside. Gradually, the boat would burn out, and the clay would become baked. Firewood would be put into the stove from the roof*". An anteroom was sometimes added to the entrance of the dwelling. For this purpose, two more forked supporting posts would be dug into the ground at a distance of about 2 m from the smaller side of the structure. Beams would be placed into the forks; their other ends would rest on the roof of the dwelling. The resulting frame was covered with split logs, turf, and sand in the same way as the rest of the building. The entrance opening would be closed with deer skin or elk skin.

The floor of the dwelling was covered with a layer of coniferous tree branches, and split pine or cedar pine boards about 30 cm wide were placed on top of this layer. In order to extend their service life, the boards would be turned over approximately every two weeks. *Poy-mats* were usually made from three to seven days; all family members who were able to work participated in the construction. The most difficult work with wood was made by men. The total number of builders was usually two to five persons (one to three of whom could carry out hard physical work). The main construction tools which were used included axes, saws, and shovels. Every autumn the dwelling was repaired. People would put moss into emerging gaps and add sand which had slid down. Eventually, this earthen cover would become more and more stable. Such a building could serve for 20 years or more with small annual repairs.

Concluding our ethnographic description, we should provide some data on the functioning of *poy-mats*. One–two families, from 1 to 10 persons including children, could live in a dwelling 4 × 3 m. According to the recollections, in the past, such buildings could have been arranged in small groups; the distance between the houses was not less than 20–30 m. The interior space was divided in the following way: the women's half was located at the entrance in front of the posts, while the further part of the house belonged to the men (and was also used for receiving guests). The sleeping space was at the sides. There were usually few things in the dwelling (only those needed for daily use); the main bulk of the things were kept outside under a shelter, in a storage shed, or on reindeer sledges. Inside the dwelling, things were mostly kept near the posts or were hung on the posts on hooks. For example, cauldrons and other kitchen things were usually hung on the two posts at the entrance. Wood for the stove was kept in the corners on both sides of the entrance. The men's things and tools were kept at the two distant posts. Given the small space of the dwelling, its inhabitants would spend a significant part of time outside. This was particularly relevant for the men who actually used *poy-mats* only for sleeping, resting, and eating. Notably, the pits remaining from extraction of sand on the perimeter of the dwelling were used for disposing household garbage.

Currently, *poy-mats* have already fallen out of use among the Upper Taz Selkups, primarily owing to the widespread use of small seasonal cribwork cabins. Nevertheless, the tradition of building *poy-mats* has not completely died out, since teenagers and children construct small replicas of them. In 2013, two such toy houses were seen on the outskirts of the village of Kikki-Akki: one was being built, and another was constructed about 3–4 years ago by teenagers who "*already went to serve in the army*". Children's buildings quite faithfully reproduce the structure of the prototype, and even include the installation of a small metal stove inside. In addition to the reduced size, their essential difference is a simplified fastening system of construction elements: most of the parts are held together by nails.

Conclusions

Thus, ancient above-ground buildings are known everywhere in the forest zone of Western Siberia.

*The Selkups use the term "black forest" for referring to a special type of terrain—mixed forest in the lowlands or flood plains, different from dry pine forest areas.

The above examples demonstrate the absence of any association between them, and suggest the convergent emergence of similar types of buildings in various groups of population at various times. However, a large number of the known settlements with the remains of above-ground dwellings are yet undated. Without additional research it is difficult to say when exactly the above-ground buildings, the remains of which are found in large numbers in the vicinity of Tyumen at the confluence of the Tura and Pyshma rivers, in the Surgut region of the Ob, or in other places (Zakh et al., 2014: 73, 111, 112–114, 154–155; Chemyakin, Zykov, 2004: 112–115, 117–120), used to function.

The preservation of certain types of structures for a long period of time testifies to their universality. The type of buildings analyzed in this study has survived until our days and had a number of features which fully satisfied the adaptive advantages of the population over several epochs. These features included simplicity and speed of construction, easily available materials and technologies, as well as low labor costs. The discovered modern half-ruined dwellings make it possible to draw some parallels with similar buildings of the ancient period, to refine our ideas concerning the form of the building, its materials, and structural details. This is especially important for those elements which have not survived with time and can be reconstructed for the most part only hypothetically (the roof, its shape and covering, methods of joining the structural details, etc.). The data provided by the population, which has until recently used above-ground frame buildings, allow us to clarify information concerning the number of people living in such a dwelling, their way of life, the purpose of this kind of structures, their interior space, and constituent parts.

The comparison of information on the remains of the excavated ancient structures and the abandoned Selkup buildings testify to their probably being of similar design. Interestingly, these "light" structures were used by the inhabitants of the North in winter conditions. The continuation of this topic is also the distance at which the *poy-mats* of the Upper Taz Selkups were located from large rivers (from several dozen to several hundred meters). This is understandable, since the residents of winter settlements were to a lesser degree dependent on water bodies: they could easily get water from snow, and in addition to fishing, other activities such as hunting, or grazing sled reindeer became relevant for them in the winter. It is remarkable that such a significant distance from dwellings to the water bodies can also be observed in ancient times. Thus, the Itkul settlements of the Tobol region are mostly located in the depth of river terraces. The Beloyarsky settlements include both forest (located deep in the forest) and riverside settlements (Chemyakin, Karacharov, 2002: 35). In the Novosibirsk region of the Ob, in the 10th–14th centuries, seasonal settlements with above-ground buildings were also located in the depth of river terraces (Adamov, 2000: 11).

The history of the gradual change of house-building traditions in the Upper Taz region and the expressed local nature of the process are noteworthy in the ethnographic description which we have presented: the population building above-ground dwellings was surrounded by neighbors close to it in cultural terms, which built the same structures but set them into the soil. Ethnographic data make it possible to see the likely reasons behind the changes: resettlement into new territories with the subsequent restructuring of the economic complex. This example of localization of the house-building tradition easily finds its parallels in archaeological materials. For example, in the Tobol region, during the Bronze to Iron Age transition, the Itkul groups of population which settled in the Tobol River valley constructed only above-ground houses, while the groups which lived in the mountain-forest zone of the Trans-Urals (the main area of the Itkul culture) built structures of three types: above-ground (surface) buildings, semi-dugouts, and houses with foundation pits of slight depth in the center (Ocherki…, 1994: 256).

Certainly, we cannot directly extrapolate ethnographic data to archaeological materials. However, the ethnographic findings which we obtained make it possible to take a fresh look at some familiar archaeological interpretations regarding above-ground frame buildings, and to make some suggestions and identify promising parallels for further research.

References

Adamov A.A. 2000
Novosibirskoye Priobye v X–XIV vv. Tobolsk, Omsk: Izd. Omsk. Gos. Ped. Univ.

Baraba v tyurkskoye vremya. 1988
V.I. Molodin, D.G. Savinov, V.S. Elagin, V.I. Sobolev, N.V. Polosmak, E.A. Sidorov, V.A. Soloviev, A.P. Borodovsky, A.V. Novikov, A.R. Kim, T.A. Chikisheva, P.I. Belanov. Novosibirsk: Nauka.

Chemyakin Y.P., Karacharov K.G. 2002
Drevnyaya istoriya Surgutskogo Priobya. In *Ocherki istorii traditsionnogo zemlepolzovaniya khantov (materialy k atlasu)*. Yekaterinburg: Tezis, pp. 7–74.

Chemyakin Y.P., Zykov A.P. 2004
Barsova gora: Arkheologicheskaya karta. Surgut, Omsk: Izd. Omsk. Gos. Ped. Univ.

Irikov S.I. 2002
Zhilishche. In *Khomich L.V., Irikov S.I., Ayupova G.E. Tazovskiye selkupy: Ocherki traditsionnoi kultury*. St. Petersburg: Prosveshcheniye, pp. 72–80.

Istoriya Yamala. 2010
In 2 vols. Vol. 1: Yamal traditsionnyi. Bk. 1: Drevniye kultury i korennye narody. Yekaterinburg: Basko.

Kenig A.V. 2001
Etnoarkheologicheskaya model sezonnosti selkupskikh stoibishch (nakopleniye i obrazovaniye kulturnogo sloya). In *Integratsiya arkheologicheskikh i etnograficheskikh issledovaniy*. Nalchik, Omsk: Izd. Omsk. Gos. Ped. Univ., pp. 60–62.

Kenig A.V. 2010
Etnoarkheologiya kak metod arkheologicheskikh rekonstruktsiy (na primere tazovskikh selkupov). Yekaterinburg, Khanty-Mansiysk: Izd. AMB.

Kosinskaya L.L., Fedorova N.V. 1994
Arkheologicheskaya karta Yamalo-Nenetskogo avtonomnogo okruga. Preprint. Yekaterinburg: UrO RAN.

Lezova S.V. 1991
Zhilishche severnykh selkupov. In *Eksperimentalnaya arkheologiya*, iss. 1. Tobolsk: Tobolsk. Gos. Ped. Inst., pp. 101–107.

Mikhalev V.V. 2008
Gorodishcha s koltsevoi sistemoi oborony v Srednem Priirtyshye (predvaritelnoye soobshcheniye). In *VII istoricheskiye chteniya pamyati M.P. Gryaznova*. Omsk: Izd. Omsk. Gos. Ped. Univ., pp. 223–224.

Mikhalev V.V., Korusenko M.A. 2007
Domostroitelnye traditsii naseleniya Nizhnego Pritarya v epokhu srednevekovya (k voprosu o sezonnykh poseleniyakh). In *Integratsiya arkheologicheskikh i etnograficheskikh issledovaniy*. Odessa, Omsk: Izd. Omsk. Gos. Ped. Univ., pp. 310–313.

Ocherki kulturogeneza narodov Zapadnoi Sibiri. 1994
Vol. 1: Poseleniya i zhilishcha. Bk. 1. Tomsk: Izd. Tomsk. Gos. Univ.

Sokolova Z.P. 1998
Zhilishche narodov Sibiri (opyt tipologii). Moscow: TriL.

Tsembalyuk S.I., Ilyushina V.V., Ryabogina N.E., Ivanov S.N. 2011
Kompleksnoye issledovaniye baitovskogo gorodishcha Borovushka 2 (lesostepnoye Pritobolye). *Vestnik arkheologii, antropologii i etnografii*, No. 2: 98−107.

Zakh V.A., Fomina E.A. 1999
K voprosu o proiskhozhdenii andreyevskoi kultury. *Vestnik arkheologii, antropologii i etnografii*, No. 2: 14–21.

Zakh V.A., Usacheva I.V., Zimina O.Y., Skochina S.N., Chikunova I.Y. 2014
Drevnosti Andreyevskoi ozernoi sistemy. Vol. 1: Arkheologicheskiye pamyatniki. Novosibirsk: Nauka.

Zimina O.Y., Zakh V.A. 2009
Nizhneye Pritobolye na rubezhe bronzovogo i zheleznogo vekov. Novosibirsk: Nauka.

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New Evidence on the Early Saka Horse Harness from Eastern Kazakhstan*

Owing to its geographic position Eastern Kazakhstan has long been a cultural crossroads. During the Scytho-Siberian Age, it was a place where the cultures of southern Siberia, Sayan-Altai, Northern and Central Kazakhstan, Zhetysu, etc. interacted, as evidenced by the "Scythian triad"—weapons, horse harness, and animal style. Here we address one of its key elements, the horse harness, specifically, new finds from Gerasimovka in the Ulan District of Eastern Kazakhstan. They are relevant to certain aspects of the early nomadic material culture in the eastern fringes of the Scytho-Saka-Siberian world. These items show significant variation, sometimes within the same cemetery. Parallels to the Gerasimovka find suggest that it is contemporaneous with the Arzhan stage of the early Scythian culture, and that during that time Eastern Kazakhstan played a major role in migration processes. Recent findings relating to early Scytho-Siberian cultures indicate the critical importance of chronology and cultural ties for reconstructing ethno-cultural processes in Early Iron Age Eurasia.

Keywords: *Eastern Kazakhstan, early Saka period, Scythians, Saka, Siberia, horse harness.*

Introduction

Field studies show that elements of horse harnesses are some of the most frequent items occurring in material complexes of the early nomads. Burials of horses in full harness, and also separate harness-sets and elements have been found in burial grounds and hoards over a fairly significant chronological range covering most of the Scytho-Saka-Siberian area, including the territory of Eastern Kazakhstan. Elements of horse harnesses are widely used for establishing chronological scales, reconstructing migration processes in ancient times, etc. In this regard, the role of new data, which give the opportunity to significantly supplement or correct the established views, becomes exceedingly important.

In the present study, we will analyze the elements of horse harnesses which go back to the early stage of the Scytho-Saka culture and originate from the destroyed burial mound in the territory of the village of Gerasimovka, Ulan District, Eastern Kazakhstan. These materials are being published for the first time*.

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The destroyed site of historical and cultural heritage mentioned above is clearly a part of the Gerasimovka mound cemetery; however, it was not included in the previous surveys. We sequentially numbered it as burial mound No. 31. The cemetery is located on the northern outskirts of the village, at the end of the first terrace of the left bank of the Irtysh River, on the flat ground between the terrace and the highway Ust-Kamenogorsk–Tavriya. The southern part of the monument was destroyed by that road and forest plantations. Some weakly defined burial mounds can be seen among the trees. Apparently, the territory of the cemetery was actively used for farming in recent years, thus, the raised area from the majority of small burial mounds was plowed over. At the time of excavation, there were 30 raised areas in two groups of burial mounds, extending in chains along the NE–SW line. The first group consisted of 24 objects, whereas the second group included six objects (No. 25–30). Deep looting pits overgrown with bushes are found at the centers of most of the mounds; ditches 3–4 m wide and 0.3–0.5 m deep can also be seen around the mounds. The diameters of all burials of the cemetery vary in the range of 15–20 m; their heights range from 0.5 to 1.0 m. The largest burial mound No. 30 has a diameter of 40 m and a height of 1.5 m (Svod…, 2006: 218).

The first archaeological research at the Gerasimovka cemetery was carried out in 1998 by the expedition of the Sarsen Amanzholov East Kazakhstan State University under the supervision of A.A. Tkachev. Two burial mounds (No. 22 and 28) were studied. A set of a horse bridle from the early Scythian time, which will be mentioned below, was discovered during the excavation of burial mound No. 22 (Tkachev, Tkacheva, 1999: 141–142, fig. 3; Tkachev, Tishkin, 1999).

Description of the finds

Elements of horse harnesses were found during earthworks in the northern part of the village of Gerasimovka. All items together with photographs were submitted to the East-Kazakhstan Regional Museum of History and Local History (Ust-Kamenogorsk) by the high school teacher E. Sansyzbayev. According to Report No. 10 of acceptance of the items for permanent storage dated March 31, 2005 (Archive of the East-Kazakhstan Regional Museum of History and Local History. D. 1-50, fol. 28–29), and the accounts of museum scholars who visited the place of the discovery, the site was partially robbed; stone slabs (probably the fragments of a stone box) and horse bones in anatomical order were found. Any evidence of human remains is absent.

Elements of the bridle. The horse was bridled with a two-partite bronze bit with stirrup-shaped endings (Fig. 1, *1*). The length of each part is 9.5 cm. Bronze cheek-pieces are straight with three holes which were made in the same plane. The length of the items is 11.5 cm; the width in the part with the holes reaches 1.5 cm. Visual analysis of cheek-pieces suggests that they were cast in the same mold. One cheek-piece is broken at the middle hole (Fig. 1, *2*, *3*).

The finds include bronze end-pieces: two of truncated conical shape from the head and shoulder straps, and one of conical shape from the chin strap (Fig. 1, *4–6*). Two large end-pieces have cylindrical holes, while the small end-piece has a conical hole. The diameter of the first two end-pieces is 2.5 cm; the diameter of the third end-piece is 1.5 cm. The finds also include three fragments of bridle-strap distributors (Fig 1, *7–9*) that look like small cylinders (approximately 1 × 1 cm at the base), somewhat flattened on four sides. This distinguishes them from relatively large breast and shoulder distributors. The finds include a fragment of a flat bronze object (Fig. 1, *10*) measuring 1.7 × 1.0 cm, which may have been a piece of a nose strap pendant. The acceptance report No. 10 does not mention this object.

Elements of saddle straps. A girth buckle with a pin and a block (Fig. 1, *11*) have been found, arched in cross-section and having rectangular frames with protruding retainers. Dimensions of the buckle and the block are approx. 8.5 × 9.5 cm. There is also a plaque-buckle of the right girth strap, measuring 6.5 × 7.0 cm (Fig. 1, *12*). In the acceptance record, the designations of some of the elements are listed incorrectly.

Discussion

Relatively good archaeological knowledge of horse equipment of the 7th–6th centuries BC in Eastern Kazakhstan and the neighboring regions has allowed us to determine with great probability the purpose of each object from the destroyed burial mound No. 31 at the Gerasimovka cemetery and to outline the tentative chronological range of their functioning.

In the 7th–early 6th century BC, functionally improved types of bits emerged in Kazakhstan along with traditional forms of bits which had the three-hole cheek-pieces. Four basic ways of connecting these elements have been identified. The bridle set which was found in the destroyed burial mound belonged to the first, traditional, type where the outer endings of the bit were attached to the middle hole of three-hole cheek-pieces with a leather strap (Shulga, 2008: 74–75). Most scholars believe that this type was used in the 8th–6th centuries BC (Kadyrbaev, 1968: 30; Gryaznov, 1980: 58; Gorbunova, 2001: 193; Shulga, 2008: 54–56).

According to M.K. Kadyrbaev, stirrup-shaped bits with an additional hole appeared in the 8th century BC

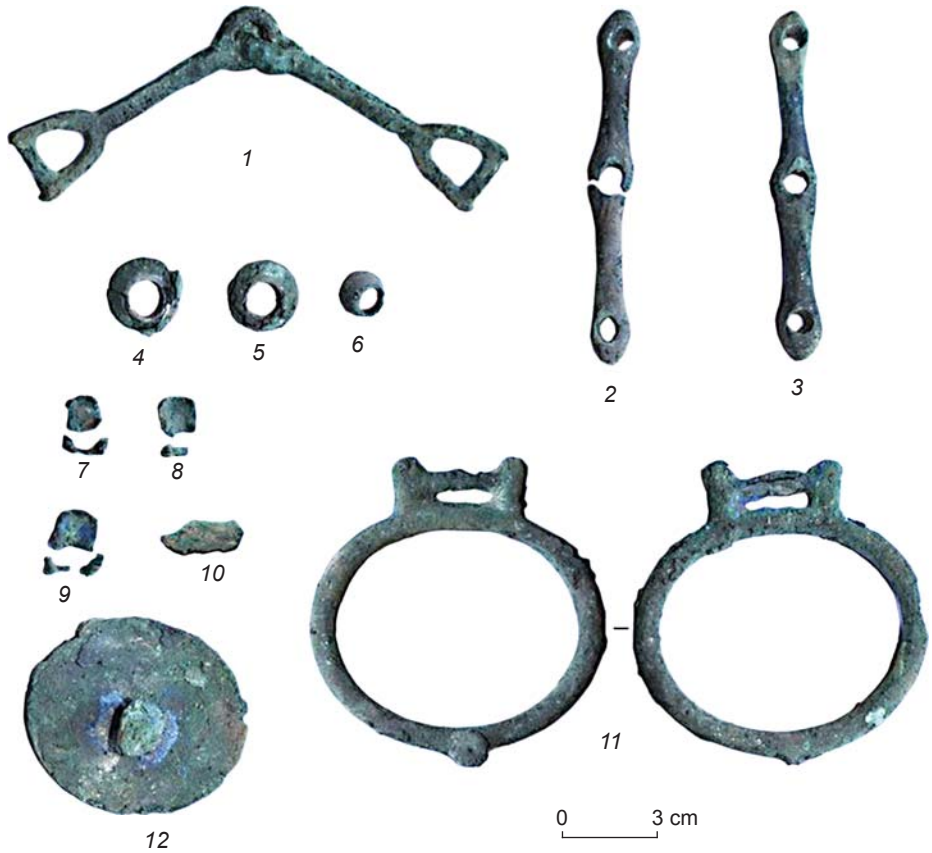

Fig. 1. Bronze elements of harness belonging to a riding horse from the burial mound No. 31 at the Gerasimovka cemetery (photograph by K.V. Chugunov).
1 – bit; *2*, *3* – cheek-pieces; *4*, *5* – end-pieces of head and shoulder straps; *6* – end-piece of chin strap; *7–9* – bridle-strap distributors; *10* – fragment of nose-strap pendant (?); *11* – girth buckle and block; *12* – girth plaque-buckle.

(1968: 30). It should be noted that the two types of stirrup-shaped bits (with the additional hole and without it), combined with three-hole cheek-pieces of various shapes made of horn or bronze, occur together in the burials of the 7th–6th centuries BC (Shulga, 2008: 68–74). Accordingly, we may assume that these types emerged simultaneously, or the second type resulted from the transformation of the first one in the process of enhancing the elements of horse control.

According to N.A. Bokovenko, stirrup-shaped bits without additional holes were widespread over almost the entire Scytho-Saka-Siberian world, but in conjunction with three-hole cheek-pieces they occur over a relatively small area (Kazakhstan, Altai, Tuva) (1979: 68–69). In any case, the majority of scholars consider bronze cheek-pieces with three holes and a stirrup-shaped bit with or without the additional hole to be the earliest (8th–7th centuries BC) elements of horse harness in the Scytho-Saka area (Vishnevskaya, Itina, 1971: 201–203; Gryaznov, 1980: 58; Gorbunova, 2001: 193).

The Gerasimovka bits which have stirrup-shaped endings (Fig. 2, *1*) containing sides that are somewhat curved outwards, are close to the seventh type according to the classification of P.I. Shulga (2008: Fig. 56). Similar bits with cheek-pieces are often found at the sites of Eastern (Arslanova, 1972: 255), Central (Kadyrbaev, 1966: 316, fig. 7), and Northern Kazakhstan (Gryaznov, 1956: 12, fig. 3), the Sayan-Altai (Chlenova, 1967: 218–219), Tuva (Gryaznov, 1980, fig. 30), and Xinjiang (Shao Hueitsyu, 2005: 100, fig. 2; Shulga, 2010: 222, fig. 76), and are dated to the 8th–6th centuries BC.

It should be noted that the Gerasimovka cheek-pieces (Fig. 2, *2*, *3*) show some similarities to the pointed Arzhan cheek-pieces from chamber No. 26 of the Arzhan-1 burial mound (Gryaznov, 1980: 37, fig. 23). The difference is the loop-like extension from the middle hole owing to a protrusion on one side. This feature can be attributed to the earlier period. A similar cheek-piece was found in chamber No. 13 of the Arzhan-1 burial mound; it also shows some features of cheek-pieces of the Arzhan type (Ibid.: 48, fig. 30, *18*). Cheek-pieces found in other chambers of this burial mound had a somewhat different form (Chugunov, 2005: 106,

fig. 1). According to the most recent studies, Arzhan-1 is dated to the late 9th century BC (Evraziya…, 2005: 68). However, insufficient knowledge of the Kurtu-Mayemir stage in Eastern Kazakhstan creates significant difficulties for reconstructing ethnic and cultural ties in the Scytho-Saka area.

Shulga identified four well-differentiated types of end-pieces widespread over this territory (2008: 85). The large end-pieces of head and shoulder straps (Fig. 2, *4*, *5*) described above can be attributed to the first type of the most massive end-pieces, while the small end-piece connecting the chin straps (Fig. 2, *6*) can be ascribed to the third type (Ibid.: 251, fig. 59). Their parallels are known from Mayemir burial mound No. 2. A bridle in the form of fragments of straps with bronze accessories was relatively well preserved *in situ* in the burial pit. The location of bronze pieces makes it possible to specify the location and functional purpose of similar components from other sites (Promezhutochnyi otchet…, 2009: 25, phot. 52, 53; Samašev, Ongar, 2013: 558, fig. 3). Similar end-pieces of bridle straps were found in the Arzhan-2 burial mound (Čugunov, Parzinger, Nagler, 2010: 158, Abb. 138, *6*, Taf. 28, *4*, *5*). It is worth noting that end-pieces cannot serve as the main indicator for establishing a relatively precise chronology, since they were used throughout the entire Scythian period, and not only in horse harnesses, but also in military belts.

Three fragments of cylindrical bridle-strap distributors (Fig. 2, *7–9*) belong to the first of the two types identified by Shulga, the "high cylindrical" type (2008: 81). They were intended to secure two straps at their intersections, and also served as decoration of the harness. In Eastern Kazakhstan, similar bridle distributors have been found in the Kamyshin assemblage (Arslanova, 1972: 255, fig. 1), and in the Kondratiyevsky burial mound No. 21 (Alekhin, Shulga, 2003: 62–63, fig. 2). The analysis of the available analogs suggests that they may have appeared in the Mayemir period; however, according to Shulga, the presence of such objects in the Zevakino assemblage (Arslanova, 1974: 57, pl. 3, *24*) may indicate an earlier origin of this kind of bridle distributor (Shulga, 2008: 82).

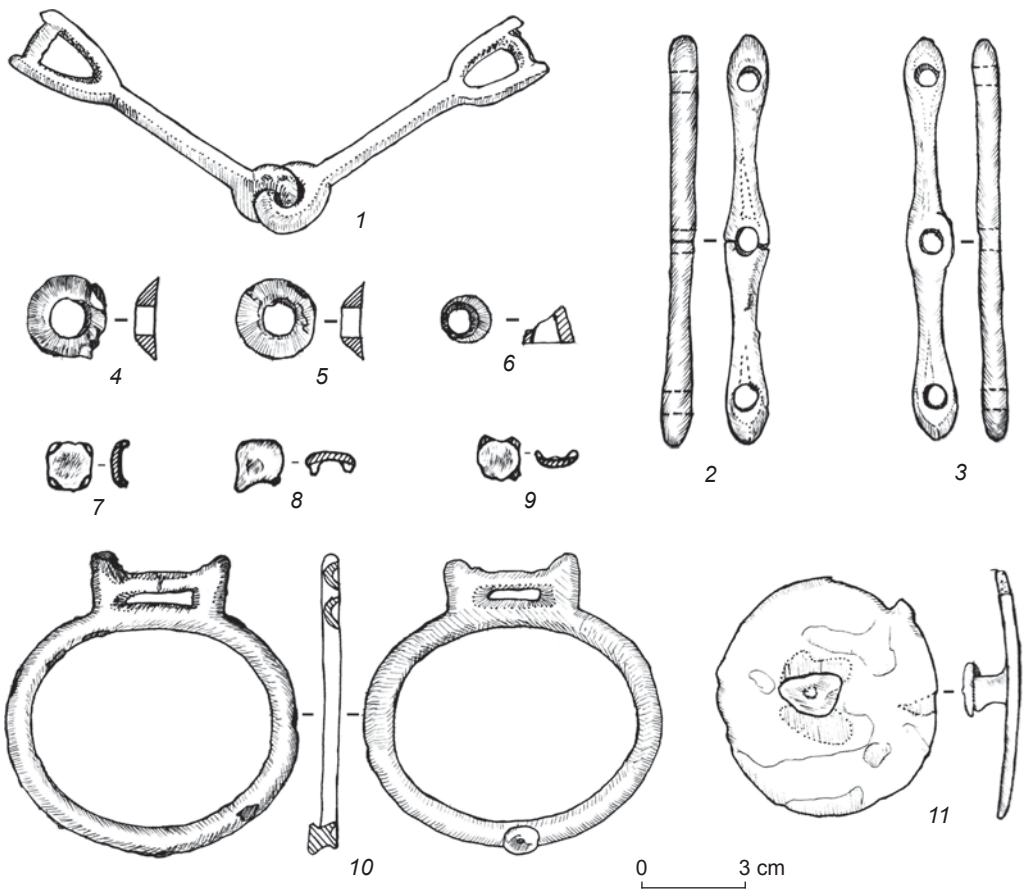

Fig. 2. Drawing of bronze elements of horse harness from the burial mound No. 31 at the Gerasimovka cemetery (drawing by E. Pechenegova).

1 – bit with stirrup-shaped endings; *2*, *3* – cheek-pieces with three holes; *4*, *5* – end-pieces of head and shoulder straps; *6* – end-piece of chin strap; *7–9* – bridle-strap distributors; *10* – girth buckle and block; *11* – girth plaque-buckle.

The elements of saddle straps and the saddle itself were analyzed in some detail by Shulga (Ibid: 93–103). The girth buckle with a pin and block (Fig. 2, *10*) originating from the destroyed burial mound in Gerasimovka can be attributed to the first of the seven types identified by Shulga (Ibid.: 96–97), with the block arched in cross-section and a segment-shaped buckle. Notably, the pin was not made in the form of a hoof; it has a simple head slightly bent outwardly. Such a shape may come from a somewhat earlier time. Parallels in Eastern Kazakhstan have been found in the Kamyshin assemblage (Arslanova, 1972: 255, fig. 1), and in the Kondratiyevsky burial mound No. 21 (Alekhin, Shulga, 2003: 62–63, fig. 1). As it is known, girth buckle-fasteners and blocks are among the most common elements in bronze harness sets of the early 7th century BC in the Sayan-Altai and Kazakhstan (Shulga, 2008: 97). In many classifications and reconstructions, girth buckles with pins are mostly considered together with blocks: the left end of the girth strap is passed through the block, while the buckle with the pin acts as a retainer of the required tension of the girth. Buckles and blocks of this type were widely used throughout the entire Scytho-Saka-Siberian area in the 8th–6th centuries BC (Ibid.: 254, fig. 62; Ermolayeva, 2012: 188, fig. 58).

The plaque-buckle (Fig. 2, *11*) can be attributed to the second variant of the first type according to the classification of Shulga (2008: 97). In Eastern Kazakhstan, such plaque-buckles are rare, maybe because they could have been replaced by a strap joint (Ibid.: 254, fig. 62). A similar buckle was found in 1911 in Eastern Kazakhstan by A.V. Adrianov (1916: 58). Such plaque-buckles were located on the right side of the horse according to the materials from the Gilevo-10 cemetery, where the remains of a saddle were found with relatively well-preserved fragments of leather girth straps showing traces of fastening to the plaque-buckle on the right side (Shulga, 2008: 97, fig. 66). Such buckles were used in the 7th–6th centuries BC (Kadyrbaev, 1966: 330–332, fig. 24, 26; Vishnevskaya, 1973: 137, pl. 5). Given the design of our bridle set, it can be argued that the plaque-buckle from the Gerasimovka burial mound belongs to the early examples. The rest of the elements of horse harness are missing from the present assemblage because of robbers or the earthworks which led to the discovery of the site.

Let us briefly turn our attention to burial mound No. 22 at the Gerasimovka cemetery. During its investigation, a bit and cheek-pieces were found in a special compartment in the northern corner of a stone box. Presumably, a ritual of *pars pro toto* was performed there, that is replacement of the accompanying burial of the horse by the burial of a part of the harness. Cheek-pieces, belonging to the category of peg-in-hole objects with a T-shaped protrusion for connection with the bit, differed from other cheek-pieces of this type by their shape (Tkachev, Tkacheva, 1999: 141–142, fig. 3). The authors note the identical form of the paired cheek-pieces and emphasize that they were cast in one mold or after the same model. According to them, such production shows the limited nature of this series. Tkachev, who identified the site and the elements of horse harness, dated them to the mid-7th century BC (Tkachev, Tishkin, 1999: 198).

All circumstances of the discovery of the destroyed Gerasimovka burial mound make it impossible to offer a complete reconstruction of its burial structures. The comparison of individual components of the burial ritual, such as the accompanying burial of the horse and the set of grave goods, point to fairly significant differences between these and the mounds at the same cemetery which were examined by Tkachev. This, firstly, indicates that there is little hope for reconstructing the burial structures, burial rite, and other components of the destroyed burial mound on the basis of other mounds which have been previously studied at the Gerasimovka cemetery, to which it undoubtedly belongs. Secondly, it may indicate that this cemetery was used by a syncretic population. To some extent, this is manifested by its materials with parallels found over the vast territory of the Scytho-Saka-Siberian area. Having recognized the extremely weak factual basis, we, however, may propose that in the initial stage of the early nomadic period, this region was a contact zone of communities with different ethnic and cultural features on the eastern periphery of the Scytho-Saka-Siberian world. At the same time, differences in burial rites and goods might have been caused by social and wealth stratification of the society. For example, self-sufficient people in terms of property, or people with relatively high social status (warriors) were buried together with their horses in full harness, while the members of the lower status and ordinary people supplied their deceased only with some elements of harness.

Another hypothetical explanation for the presence of elements of horse harnesses with various features in the same cemetery can possibly be processes of modernization of the harness set, which in turn, may indicate the emergence of the cemetery during the transitional phase in the dynamic development of horse harnesses.

Conclusions

Until today, in spite of a large number of investigated burial grounds, the southern regions of Eastern Kazakhstan have not been studied well enough to provide ample

information about the culture of the early nomads. The emergence of new materials and new comprehensive approaches to their analysis will lead to significant progress in this direction. The elements of harness found in the destroyed Gerasimovka mound represent a classic example of horse trappings at the initial stage of the early nomadic period. Summarizing all the above chronological indicators, we can date this assemblage to the second half of the 7th–6th centuries BC.

Eastern Kazakhstan was a center for the various cultures of the Scytho-Saka-Siberian world. In this region, we may speak about political consolidation of large leading cultural regions that were very closely related. Determining the chronology of burial sites as well as identifying cultural links between the contemporaneous ethnic groups may provide insight into the key aspects of Scytho-Saka cultures. Nevertheless, the problem associated with the origins of the early stage of the "Saka-Scythian triad" and its development in the whole of the Eurasian cultural continuum is very complex and requires careful comparative analysis of all materials. It should be noted that the emergence of individual elements of material culture in the early Saka period resulted from an extensive cultural exchange over the vast territory of the Eurasian steppe belt in the beginning of the first millennium BC.

All of the above will be confirmed or refuted in the course of the works planned for the nearest future on the territory of the Gerasimovka cemetery. They are crucial owing to extremely poor knowledge of this area and the entire region. We should emphasize the particular importance of new published materials that undoubtedly will contribute to reconstructing a number of important aspects of the life of the population living in the eastern regions of the Scytho-Saka world at the initial stage of the early nomadic period.

References

Adrianov A.V. 1916
K arkheologii Zapadnogo Altaya (iz poezdki v Semipalatinskuyu oblast v 1911 g. Petrograd: [s.l.]. (Izvestiya Arkheologicheskoi komissii; iss. 62).

Alekhin Y.P., Shulga P.I. 2003
Kurgan Kondratyevka XXI – novyi pamyatnik ranneskifskogo vremeni na Rudnom Altae. *Drevnosti Altaya*, iss. 10: 62–70.

Arslanova F.K. 1972
Novye materialy VII–VI vv. do n.e. iz Vostochnogo Kazakhstana. *Sovetskaya arkheologiya*, No. 1: 253–258.

Arslanova F.K. 1974
Pogrebalnyi kompleks VIII–VII vekov do nashei ery iz Vostochnogo Kazakhstana. In *V glub vekov: Arkheologicheskiy sbornik.* Alma-Ata: Nauka KazSSR, pp. 46–60.

Bokovenko N.A. 1979
Ranniye formy skifo-sibirskoi uzdy. In *Problemy skifo-sibirskogo kulturno-istoricheskogo edinstva*. Kemerovo: Kemerov. Gos. Univ., pp. 67–70.

Chlenova N.L. 1967
Proiskhozhdeniye i rannyaya istoriya plemen tagarskoi kultury. Moscow: Nauka.

Chugunov K.V. 2005
Uzdechnye komplekty aldy-belskoi kultury v kontekste razvitiya konskogo snaryazheniya. In *Snaryazheniye kochevnikov Evrazii*. Barnaul: Izd. Altai. Gos. Univ., pp. 103–109.

Čugunov K.V., Parzinger H., Nagler A. 2010
Der skythenzeitliche Fürstenkurgan Aržan 2 in Tuva. Mainz: Verlag Philipp von Zabern. (Archäologie in Eurasien; No. 26). (Steppenvölker Eurasiens; No. 3).

Ermolayeva A.S. 2012
Pamyatniki predgornoi zony Kazakhskogo Altaya (epokha bronzy – ranneye zhelezo). Almaty: Izd. IA KN MON RK.

Evraziya v skifskuyu epokhu: Radiouglerodnaya i arkheologicheskaya khronologiya. 2005
A.Y. Alekseyev, N.A. Bokovenko, S.S. Vasiliev, V.A. Dergachev, G.I. Zaitseva, N.N. Kovalyukh, G. Kuk, J. van der Plicht, G. Possnert, A.A. Sementsov, E.M. Scott, K.V. Chugunov. St. Petersburg: Teza.

Gorbunova N.G. 2001
Konskaya upryazh rannikh sakov Tsentralnoi Azii (Srednyaya Aziya i Kazakhstan, krome Zapadnogo). In *Drevniye tsivilizatsii Evrazii: Istoriya i kultura*. Moscow: Vost. lit., pp. 179–200.

Gryaznov M.P. 1956
Severnyi Kazakhstan v epokhu rannikh kochevnikov. *Kratkiye soobshcheniya Instituta materialnoi kultury*, vol. 61: 8–16.

Gryaznov M.P. 1980
Arzhan: Tsarskiy kurgan ranneskifskogo vremeni. Leningrad: Nauka.

Kadyrbaev M.K. 1966
Pamyatniki tasmolinskoi kultury. In *Drevnyaya kultura Tsentralnogo Kazakhstana*. Alma-Ata: Nauka KazSSR, pp. 303–433.

Kadyrbaev M.K. 1968
Nekotorye itogi i perspektivy izucheniya arkheologii rannezheleznogo veka Kazakhstana. In *Novoye v arkheologii Kazakhstana*. Alma-Ata: Nauka KazSSR, pp. 21–36.

Promezhutochnyi otchet o nauchno-issledovatelskoi rabote v Vostochnom Kazakhstane za 2009 g. 2009
Arkhiv IA KN MON RK. F. 11, Inv. 2, D. 2285.

Samašev Z., Ongar A. 2013
Die Nomaden der kasachischen Steppe in der Früheisenzeit. In *Unbekanntes Kasachstan – Archäologie im Herzen Asiens*, Bd. 2. Bochum: Deutsches Bergbau-Museum, pp. 555–573.

Shao Hueitsyu. 2005
Studying of metal horse equipments in the Northern regions of China to a dynasty Qin. In *Archaeological Researches of a Border-Zone*. Beijing: Kesyuechubanshe, pp. 96–114. (In Chinese).

Shulga P.I. 2008
Snaryazheniye verkhovoi loshadi i voinskiye poyasa na Altae. Pt. 1: Ranneskifskoe vremya. Barnaul: Azbuka.

Shulga P.I. 2010
Sintszyan v VIII–III vv. do n.e. (pogrebalnye kompleksy, khronologiya i periodizatsiya). Barnaul: Izd. Altai. Gos. Tekhn. Univ.

Svod arkheologicheskikh pamyatnikov Vostochno-Kazakhstanskoi oblasti. 2006
Ust-Kamenogorsk: Izd. Gos. fonda podderzhki kultury i iskusstva.

Tkachev A.A., Tishkin A.A. 1999
Kurgany ranneskifskogo vremeni na mogilnike Gerasimovka v Vostochnom Kazakhstane. In *Itogi izucheniya skifskoi epokhi Altaya i sopredelnykh territorii*. Barnaul: Izd. Altai. Gos. Univ., pp. 194–198.

Tkachev A.A., Tkacheva N.A. 1999
Itogi issledovaniya arkheologicheskikh pamyatnikov Ust-Kamenogorskogo mikroraiona (1994–1998 gg.). *Vestnik arkheologii, antropologii i etnografii*, No. 2: 136–145.

Vishnevskaya O.A. 1973
Kultura sakskikh plemen nizovyev Syrdaryi v VII–V vv. do n.e. (po materialam Uigaraka). Moscow: Nauka. (Trudy Khorezm. arkheol.-etnogr. ekspeditsii; vol. 8).

Vishnevskaya O.A., Itina M.A. 1971
Ranniye saki Priaralya. In *Problemy skifskoi arkheologii*. Moscow: Nauka, pp. 197–208. (MIA; No. 177).

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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).

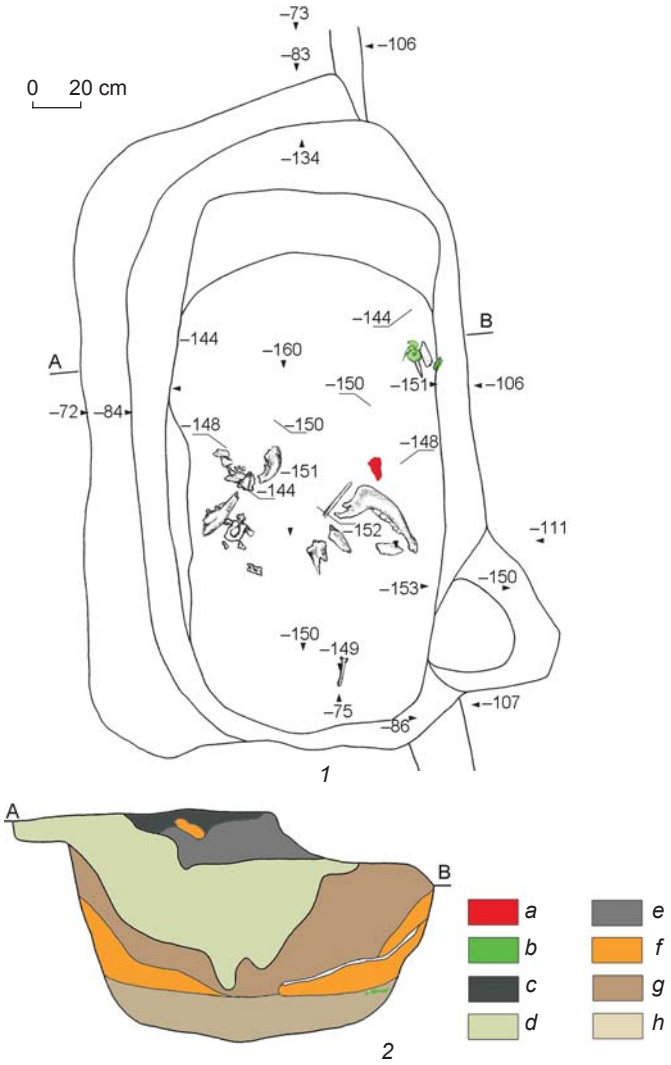

Fig. 1. Location of the "caster's cache" in pit No. 109.
1, *3* – layout of the pit; *2* – profile of the pit: *a* – pottery; *b* – bronze items; *c* – heterogeneous mixed dark-gray sandy loam; *d* – homogeneous loose black sandy loam; *e* – black sandy loam; *f* – dark-gray sandy loam; *g* – packed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

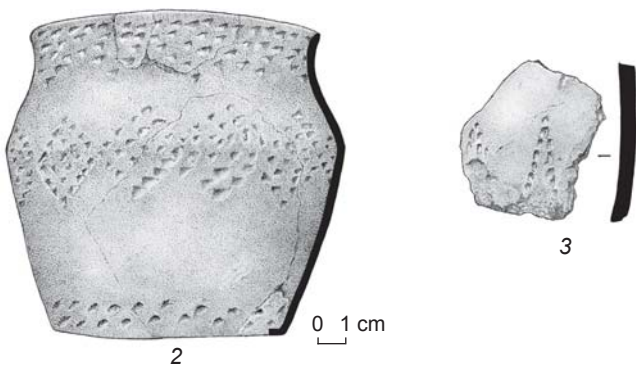

Fig. 2. Pieces (*1*) and reconstruction (*2*) of vessel No. 1, fragment of vessel No. 2 (*3*).

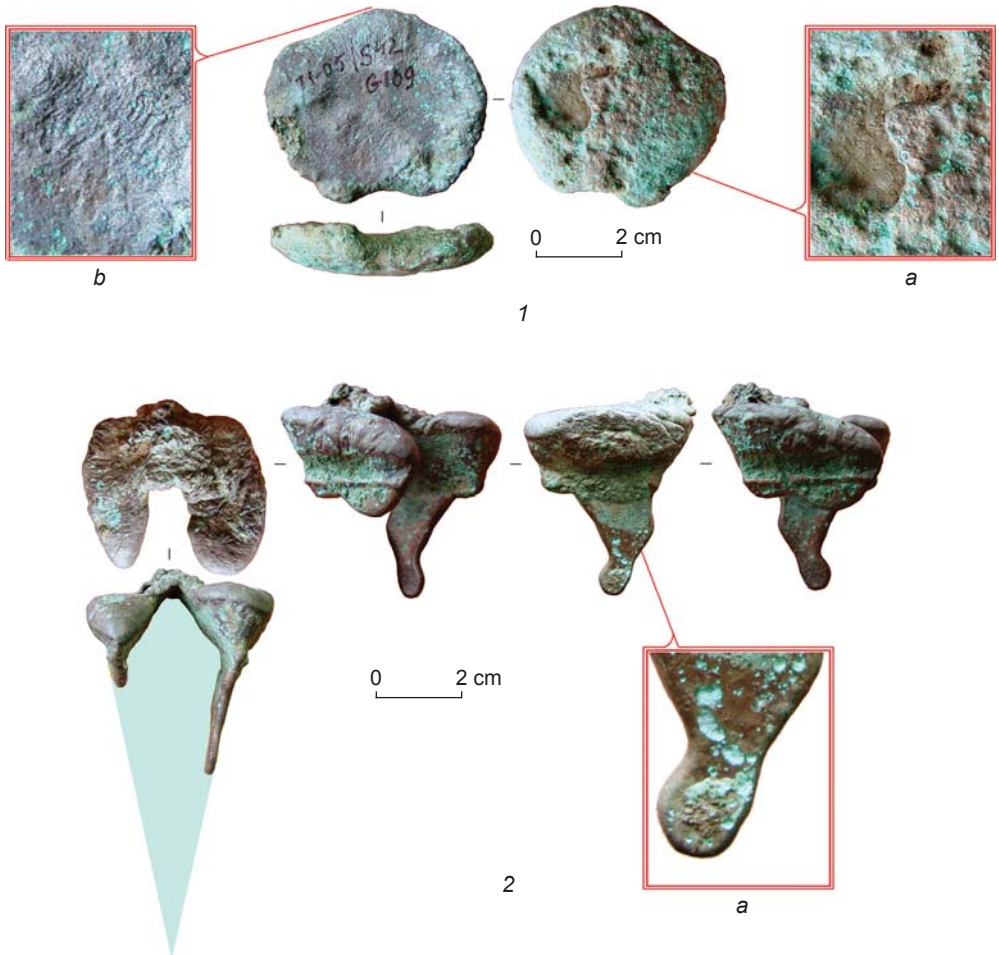

Fig. 3. Copper ingots from the "cache".
1 – plano-convex copper ingot No. 1: *a* – blowhole and solidified end metal flow, *b* – tree-like structure of the ingot surface;
2 – ingot No. 2 (sprue): *a* – crystallization traces at the metal flow end.

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

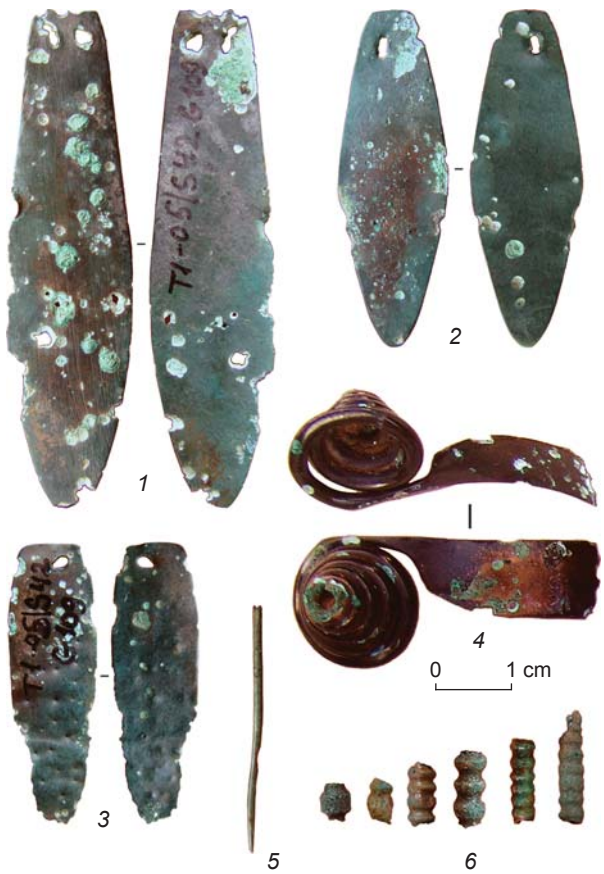

Fig. 4. Bronze artifacts from the "caster's cache".
1–3 – knife-like pendants; *4* – a fragment of a bracelet with a cone-shaped end; *5* – a needle; *6* – beads.

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.

References

Avanesova N.A. 1991
Kultura pastusheskikh plemen epokhi bronzy aziatskoi chasti SSSR (po metallicheskim izdeliyam). Tashkent: Fan.

Avilova L.I. 2008
Metall Blizhnego Vostoka. Modeli proizvodstva v eneolite, rannem i srednem bronzovom veke. Moscow: Pamyatniki ist. mysli.

Avilova L.I., Terekhova N.N. 2006
Standartnye slitki metalla na Blizhnem Vostoke v epokhu eneolita – bronzovogo veka. In *Arkheologiya i estestvennonauchnye metody*. Moscow: Nauka, pp. 14–33. (KSIA; No. 220).

Bochkarev V.S. 2002
Problemy interpretatsii evropeiskikh kladov metallicheskikh izdeliy epokhi bronzy. In *Klady: sostav, khronologiya, interpretatsiya*. St. Petersburg: SPb. Gos. Univ., pp. 46–54.

Chantre E. 1875–1876
Etudes paléoethnologiques dans le bassin du Rhône, Âge du Bronze. Vol. 1: Industrie de l'Âge du Bronze. Paris: Librairie polytechnique J. Baudry.

Chernykh E.N. 2007
Kargaly, vol. V. Moscow: Yazyki slavyan. kultury.

Childe V.G. 1930
The Bronze Age. Cambridge: Cambridge Univ. Press.

Cordier G. 2009
L'Age du Bronze dans les pays de la Loire moyenne. Joué-lès-Tours: La Simarre.

Demin M.A., Zaprudsky S.S., Sitnikov S.M. 2011
Andronovskiye ukrasheniya Gilevskogo arkheologicheskogo mikroraiona. Barnaul: Alt. Gos. Ped. Akademiya.

Ermolayeva A.S. 2001
Pogrebeniya epokhi bronzy mogilnikov Maloye Karasu i Kovalevka levoberezhnogo Irtysha. In *Istoriya i arkheologiya Semirechya*, iss. 2. Almaty: Fond "Rodnichok", pp. 102–111.

Gening V.F., Stefanova N.K. 1994
Chernoozerye I – mogilnik epokhi bronzy Srednego Priirtyshya. Yekaterinburg: Ural. Gos. Univ.

Hansen S. 1994
Studien zu den Metalldeponierungen während der alteren Urnenfelderzeit im Rhein-Main-Gebiet. Bonn: In Kommission bei Habelt.

Kiryushin Y.F., Grushin S.P., Orlova L.A., Papin D.V. 2007
Khronologiya bronzovogo veka na Altae (problemy radiouglerodnogo datirovaniya). In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. XIII. Novosibirsk: Izd. IAE SO RAN, pp. 255–259.

Kovtun I.V. 2014
Tipologiya i khronologiya andronovskikh brasletov s konusovidnymi spiralyami na okonchaniyakh. In *Teoriya i praktika arkheologicheskikh issledovaniy*, iss. 2. Barnaul: Altai. Gos. Univ., pp. 25–30.

Kozhomberdiev I., Kuzmina E.E. 1980
Shamshinskiy klad epokhi pozdnei bronzy v Kirgizii. *Sovetskaya arkheologiya*, No. 4: 140–153.

Krivtsova-Grakova O.A. 1948
Alekseyevskoye poseleniye i mogilnik. In *Arkheologicheskiy sbornik*, iss. XVII. Moscow: Gos. Ist. muzei, pp. 59–172.

Krivtsova-Grakova O.A. 1955
Stepnoye Povolzhye i Prichernomorye v epokhu pozdnei bronzy. Moscow: AN SSSR. (MIA; No. 46).

Matyushchenko V.I. 2004
Elovskiy arkheologicheskiy kompleks, pt. II. Omsk: Omsk. Gos. Univ.

Molodin V.I. 1977
Epokha neolita i bronzy lesostepnogo Ob-Irtyshya. Novosibirsk: Nauka.

Molodin V.I. 1985
Baraba v epokhu bronzy. Novosibirsk: Nauka.

Molodin V.I. 2006
Otchet ob arkheologicheskikh issledovaniyakh v Vengerovskom i Chanovskom raionakh Novosibirskoi oblasti v 2006 g. Arkhiv IAET SO RAN. F. 1, Inv. 1, D. 281.

Molodin V.I. 2013
Seiminsko-turbinskiye bronzy v "zakrytykh" kompleksakh odinovskoi kultury (Barabinskaya lesostep). In *Fundamentalnye problemy arkheologii, antropologii i etnografii Evrazii*. Novosibirsk: Izd. IAE SO RAN, pp. 309–324.

Molodin V.I. 2014
The Late Krotovo (Cherno-Ozerye) culture in the Irtysh forest-steppe, Western Siberia. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 42 (1): 49–54.

Molodin V.I., Durakov I.A., Mylnikova L.N., Nesterova M.S. 2012
Proizvodstvennyi kompleks krotovskoi kultury na poselenii Vengerovo-2 (Barabinskaya lesostep). *Vestnik Novosib. Gos. Univ*. Ser.: Istoriya, filologiya, vol. 11, iss. 5: 104–119.

Molodin V.I., Marchenko Z.V., Grishin A.E. 2011
Radiouglerodnaya khronologiya pozdnekrotovskikh i andronovskikh (fedorovskikh) pamyatnikov tsentralnoi chasti Barabinskoi lesostepi (Zapadnaya Sibir). In *Trudy III (XIX) Vseros. arkheol. syezda*, vol. I. St. Petersburg, Moscow: Veliky Novgorod, pp. 251–252.

Molodin V.I., Novikova O.I., Grishin A.E., Garkusha Y.N., Marchenko Z.V., Rybina E.V., Pilipenko A.S., Labetsky V.P. 2006
Izucheniye pamyatnika epokhi bronzy Tartas-1. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. XII, pt. I. Novosibirsk: Izd. IAE SO RAN, pp. 422–427.

Molodin V.I., Parzinger H., Marchenko Z.V., Piezonka H., Orlova L.A., Kuzmin V.Y., Grishin A.E. 2008
Pervye radiouglerodnye daty pogrebeniy epokhi bronzy mogilnika Tartas-1 (popytka osmysleniya). In *Trudy II (XVIII) Vseros. arkheol. syezda v Suzdale*, vol. 1. Moscow: IA RAN, pp. 325–328.

Mozsolics A. 1985
Ein Beitrag zum Metallhandwerk der ungarischen Bronzezeit. In *Bericht der Römisch-Germanischen Komission*, Bd. 65. Mainz am Rhein: Philipp von Zabern, pp. 20–96.

Nagler A., Kobeleva L.S., Durakov I.A., Molodin V.I., Hansen S. 2012
Andronovskiye (fedorovskiye) kurgany mogilnika Pogorelka-2 v Tsentralnoi Barabe. In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*, vol. XVIII. Novosibirsk: Izd. IAE SO RAN, pp. 249–253.

Pazukhin V.A. 1969
Mednye slitki iz Orenburgskogo muzeya. *Sovetskaya arkheologiya*, No. 4: 239–245.

Pigott V.C. 1999
The development of metal production on the Iranian Plateau: An archaeometallurgical perspective. In *The Archaeometallurgy of the Asian Old World*, V.C. Pigott (ed.). Philadelphia (PA): Univ. of Pennsilvania, Univ. Museum, pp. 73–106 (MASCA Res. Pap. in Sci. and Archaeol.; vol. 16).

Semenov Y.I. 1977
Ob iznachalnoi forme pervobytnykh sotsialno-ekonomicheskikh otnosheniy. *Sovetskaya etnografiya*, No. 2: 15–28.

Sorokin V.S. 1960
Mogilnik bronzovoi epokhi Tasty-Butak-1 v Zapadnom Kazakhstane. Moscow, Leningrad: AN SSSR. (MIA; No. 120).

Sunchugashev Y.I. 1975
Drevneishiye rudniki i pamyatniki rannei metallurgii v Khakassko-Minusinskoi kotlovine. Moscow: Nauka.

Tallon F. 1987
Métallurgie susienne I. De la fondation de Suse au XVIII-e siècle avant J.-C., vol. 1. Paris: Ministère de la culture et de la communication.

Tylecote R.F. 1987
The Early History of Metallurgy in Europe. London: Longman Group United Kingdom.

Vinogradov N.B. 2011
Stepi Yuzhnogo Urala i Kazakhstana v pervye veka II tys. do n.e. (pamyatniki sintashtinskogo i petrovskogo tipa). Chelyabinsk: Abris.

Zimina V.M., Adamenko O.M. 1963
Novyi pamyatnik kultury epokhi bronzy u sela Novo-Aleksandrovka. *Izvestiya Sib. Otd. AN SSSR*, No. 9: Ser. obshchestv. nauk, iss. 3: 53–59.

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Modeling the Deformation of Bone Points: Archaeological and Experimental Data*

Bone and antler tools are a highly informative category of artifacts. Variously sized and shaped projectile (spear, harpoon, arrow, and dart) points spanning the periods from the Paleolithic to recent centuries are of special importance. In this article, we review the most noteworthy directions in Western (European and North American) experimental research performed in the 20th and early 21st century, outline the results of our own experiments in using bone points, and discuss parallels among Siberian and Eastern European prehistoric cultures. In our experiments with the use of an archery bow, special attention was paid to fastening the arrowhead to the shaft and to properties of the material (bone and antler). Most experimenters believe that deformation of bone points is a reliable indicator of their artificial nature and of the ways they were used in hunting (as projectiles or for preparing animal skins), warfare, or ritual activities. The latter include symbolic shooting at rock drawings before hunting and at landscape features such as crevices and trees, as exemplified by a ritual practiced by the California Indians.

Keywords: *Archaeology, experiment, projectiles, bone points, deformation, hunting, ritual.*

Introduction

Bone tools belong to a unique category of implements that were widely used in almost all regions of the world and that maintained their importance and effectiveness throughout all archaeological periods (the Paleolithic, Neolithic, Bronze Age, and Iron Age). Bone (antler) materials also provide information and make it possible to reconstruct their processing techniques, to determine their functional purpose and possible reasons for damage and wear. The experimental method plays a primary role in these studies. In the 20th and the 21st centuries, international archeological science has gained diverse experience in modeling destruction processes in stone and bone points of projectile weaponry (arrows and darts) from the Paleolithic to the Metal Age, using experimental methods.

This article overviews the most interesting studies of international (European and American) experts, and presents the results of our own experiments that have made it possible to clarify the process of deformation of stemmed bone arrowheads after shooting at stone and bone, and to verify the accuracy of suggestions on their use in hunting, warfare, and rituals.

The range and specific results of international studies

Experimental study into the properties of projectile points made of stone, volcanic glass (obsidian), and organic materials (bone, antler, wood, shells) has a long-standing tradition. Thus, from 1935–2009, *American Antiquity*, one

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of the leading U.S. archaeological journals, published a series of articles on the deformation of stone and bone points in missile weaponry (arrows and darts).

One of the first experimental studies of deformation process in bone points was conducted in the 1930s by E.E. Tyzzer (1935–1936). The study confirmed the hypothesis that the so-called simple bone point (one of the most common finds on the East Coast of the U.S.) was an arrowhead, but not a fragment of bone that resulted from food consumption. For testing his hypothesis, Tyzzer compared the damage known from these finds with experimental samples. He paid great attention to the nature of damages and their possible causes. During the experiment, arrows equipped with simple bone points were shot at stony loam and gravel. A common type of damage was lateral spallation at the "heavy" edges (the center of gravity in each point was shifted to one of the edges) and at the tip of the projectile point.

S. Arndt and M. Newcomer, followed by C. Bergman (Arndt, Newcomer, 1986; Bergman, 1987) conducted meticulous studies of deformation features in bone points and tips from the Stone Age archaeological collections of the British Isles, Northern Europe, and the Levant. Thus, using materials from the site of Ksar Akil (Lebanon), Bergman observed that bone and antler points seemed to have been more practical; they were made faster and could be repaired easier. In addition, antler was preferred over bone by the ancient inhabitants of the settlement (73 % and 27 %, respectively) (Bergman, 1987: 125).

The destruction of stone-tipped darts was described in a study by G. Frison (1989) on the experimental use of implements in the Clovis culture (the prehistoric Paleo-Indian culture in North America, 11,500–10,800 BP). The possibility for using these implements in hunting mammoths was tested on African elephants. Another interesting study was conducted by J. Cheshier and R. Kelly, who studied the influence of the shape and weight of the stone dart tip on its penetration capacity (2006).

In 2009, a collective work (Waguespack et al., 2009) on the benefits of stone points over the sharpened shafts of arrows was published. The following results were obtained from shooting the bow at a plastic model: the stone tip penetrated only 10 % deeper than the sharpened shaft, while the costs of its production and operation were significantly higher. These data suggest that stone points (particularly those made of decorative varieties of raw materials and of very large size) illustrated prestigious technologies and performed a ritual function (Tabarev, 2005–2009).

Among recently published works, we should note a collection of articles in the BAR series (Ancient…, 2010) that contains a variety of studies on the technology, functional purpose (use-wear), and cultural interpretation of bone tools: publications of the Argentine researcher N. Buc on macro- and micro-deformation (see, e.g., (Buc, 2011)), and studies of J. Bradfield and his colleagues on bone points and tips in archaeological and ethnographic collections from South Africa (see, e.g., (Bradfield, 2012)). One of the latter studies provides a detailed classification of deformations in bone points, such as a spiral fracture, hairline fracture, oblique fracture, beveled fracture, transversal fracture, and their numerous varieties (Bradfield, Brand, 2015).

According to the majority of international experts in experimental archaeology, deformation of the point is one of the reliable signs indicating the artificial origin of the object, and also a basis for hypotheses concerning the functional purpose of points.

Experimental modeling of deformation processes in bone points

An experimental study was conducted by A.P. Borodovsky following the analysis of a series of destroyed bone points from the Early Iron Age deposits in Denisova Cave (Derevianko, Molodin, 1994: 46, fig. 39; 103). The tip of the striking part in the majority of these objects was damaged, which was interpreted as a result of ritual shooting at the wall of the cave (Ibid.: 44, fig. 37, *10*; 46, fig. 39, *6*; 103; 132). During the experiments (shooting was carried out at rock surface using a traditional archery bow with a tension force not exceeding 15 kg), such type of destruction in bone points was confirmed (Fig. 1–3). Another feature of damage in bone tips when they were shot at a rock surface, which was established experimentally, was the spalling of the arrowhead edges (Fig. 2). This type of damage also occurred in the experimental series (Ibid.: 44, fig. 37, *11*). However, not all fragments of bone arrowheads of the Early Iron Age from Denisova Cave can be correlated with the results of shooting at rock surface (Ibid.: 46, fig. 39). This is especially true for the points with broken stems (Ibid., fig. 39, *11–14*). Experiments have quite clearly shown that shooting at rock with an arrow equipped with a bone arrowhead resulted in the turning of the stem towards the impact (Fig. 4). This, however, did not lead to the destruction of the stem as is typical of the fragments of points from Denisova Cave. In the experiment, two variants of attaching the point to the shaft have been tested: rigid hafting with coiling (Fig. 2, 3) and simple insertion into the split end of the shaft (Fig. 1, *1*, *2*). In the former case, after colliding with a stone surface, the arrowhead would become somewhat twisted in the place of its attachment to the shaft (Fig. 3), while in the latter case, the arrowhead would almost completely slip out of the split end of the shaft (Fig. 4, *2*). Thus, the destruction

Fig. 1. Experimental bone points.

Fig. 2. Experimental bone point (Fig. 1, *5*) after shooting at a stone surface.

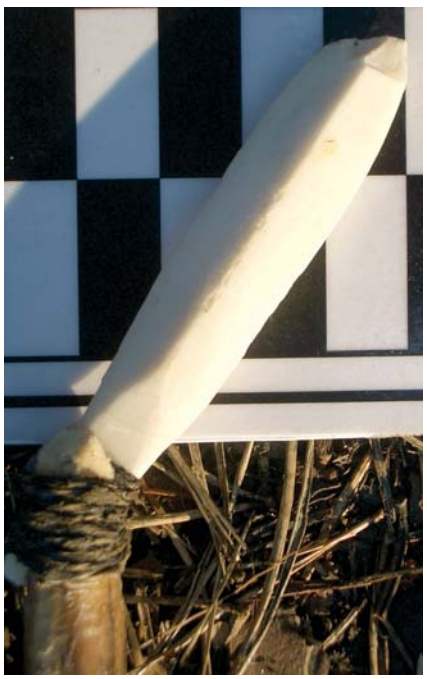

Fig. 3. Experimental bone point (Fig. 1, *6*) after shooting at a stone surface.

1

2

Fig. 4. Experimental bone point (Fig. 1, *1*) unattached to the shaft after shooting at a stone surface.
1 – collision of bone point with a rock surface;
2 – location of bone point after striking the rock surface.

of stems in the points from Denisova Cave was unlikely the result of shooting at the rock, and moreover, the finds include some points with clear signs of trimming with a metal blade (Ibid.: Fig. 39, *13*).

Fig. 5. Flat bone of a cow skull with the fragment of the tip remaining from the experimental bone point.

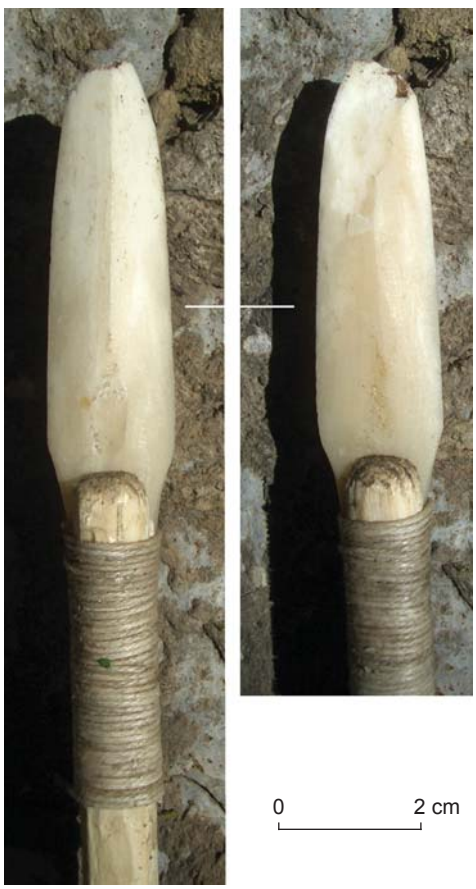

Fig. 6. Experimental bone point with destroyed tip after shooting at a cow skull.

The nature of damage to bone tips after colliding with rock surface is clearly conditioned by the structure of bone material (Borodovsky, 1997: 162, pl. 1). The density of the medium with which the bone point would collide, is of particular importance. In particular, the experiments have shown that after the impact of a bone point with a material similar in density, for example, with a tubular bone in the prey's body, it does not become destroyed, but the shaft of the arrow breaks inside soft tissues, and the arrow cannot be removed without surgical intervention. When the bone point collides with less firm flat bone (for example, a vertebra, a scapula, or bones of the skull), it enters deep into the bone, and, as the experiments have shown, the point may break off at the tip (Fig. 5, 6). According to archaeological data, an example of such penetration is known from burial 15 of Object No. 4, located near the town of Sukhanikha in the Minusinsk Depression, where a bone arrowhead was discovered in the lumbar vertebra of the buried person (Koni…, 2010: 109). This location corresponds to one of the most common areas struck by metal arrowheads, known from pictorial materials of the Ancient World and the archaeological data of the Metal Age on the territory of South-Western Siberia (Borodovsky et al., 2010: 44, fig. 11, *3*, *16*).

Samples of destruction of bone tips after shooting at less firm flat bones exhibit completely different features as compared to the results of collision with rock surface. The main difference is that in the former case (impact on bone), a long spall is formed on the tip, which covers a significant part of the general plane of the blade (Fig. 6), while in the latter case (collision with a stone surface), the destruction of the tip does not always involve the blade (Fig. 3). Another feature of damage in bone points when shooting at a sufficiently dense surface is lateral spalls of the blade, noted already by Tyzzer (1935–1936) (Fig. 2). Thus, we can conclude that shooting at rock surface with arrows equipped with bone points results in very distinctive damage to the arrowheads. Furthermore, in interpreting the damage of the bone points it should be noted that these objects belong to the category of universal implements (Borodovsky, 1997: 193, pl. 32), and therefore their various deformations could have been associated with an additional range of uses.

Conclusions

In general, experimental results obtained by international experts and the authors of this study, associated with deformation of bone arrowheads, combined with archaeological and ethnographic data, make it possible to estimate the real striking capacities of bone arrowheads when they are used for hunting, military, or ritual purposes. Each of these areas is an extremely interesting field for research and discussions.

The range of uses of bone points for hunting and fishing is very wide, involving not only direct striking of prey, but also processing of products obtained from hunting (leather, skins) or fishery (Borodovsky, 1997: 193, pl. 32). The multifunctional nature of some of the bone points is paralleled by quite early emergence of specialized implements. Thus, the above-mentioned projectile points from South Africa (Namibia) include clearly distinguishable thin and elegant arrowheads with poison applied to their tips before hunting, and also heavier arrowheads apparently intended for striking a different kind of prey. The difference in the morphology of the objects is confirmed by the various nature of their use-wear and deformation (Bradfield, Brand, 2015).

The discussion about the time of emergence and the specific features of projectile points used in intergroup conflicts or, in other words, the objects of weaponry, is still continuing. A number of European experts believe that projectile points maintained their multifunctionality for a long time, whereas specialized projectile points for warfare appeared sufficiently later. Thus, using the Neolithic and Bronze Age materials from Europe, J. Chapman has offered the following sequence: implements for hunting with a possible use in warfare, implements for warfare also preserving a utilitarian function, and finally, specialized implements for warfare (1999). A different point of view was expressed by H. Luik: the analysis of the arrowheads found at the Bronze Age sites and fortified settlements in the Baltics (1st millennium BC), clearly showed that blunted points made of elk antlers and small bone points were used for hunting, while larger and more carefully produced points, spurred or non-spurred, were obviously intended for military purposes (2006).

Finally, the ritual use of bone points and, accordingly, the specific nature of their deformation are associated with a variety of rituals and ceremonies in the societies of hunter-gatherers, breeders, and farmers. Such rituals included, for example, ritual shooting at rock drawings before hunting, and shooting at specific targets or features of landscape. As an example, we may point to a sacred object in California (USA). While on a scholarly trip, A.V. Tabarev visited canyons not far from the town of Riverside, where the sacred sites of the Native Americans have been preserved. One of the sites was a narrow horizontal crevice at a height of about 10 m, where, according to the explanation of the American colleagues, one had to shoot a bow in such a way that the arrow would get stuck in the rock. Until now, several dozens of stone, metal, and bone arrowheads of all ages have remained in the crevice (Fig. 7). Judging by the numerous fragments of arrows at the bottom of the cliff, it was not an easy task to hit the target. Most likely, this procedure initially had a ritual meaning and served as a confirmation of the excellent capacities of the shooter and his hunting skills, and over time, acquired a purely competitive nature.

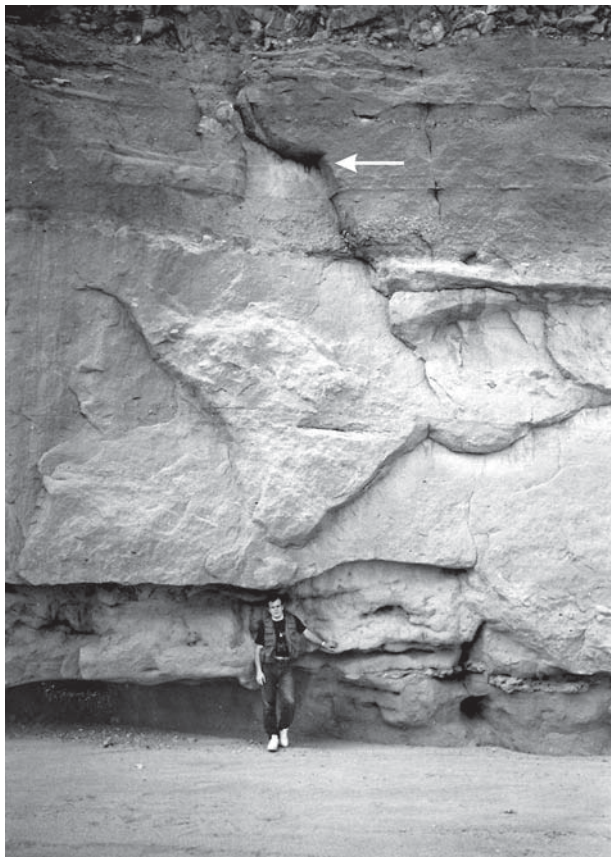

Fig. 7. Ritual object in canyon near the town of Riverside (California, USA). Photograph from the archive of A.V. Tabarev.

Further research on this subject and accumulation of experience on the part of Russian and international experts seems to be a very promising field involving a wide range of experimentation and archaeological interpretations.

References

Ancient and Modern Bone Artefacts from America to Russia: Cultural, Technological and Functional Signature. 2010
Oxford: BAR. (BAR Intern. Ser.; No. 2136).

Arndt S., Newcomer M. 1986
Breakage patterns on prehistoric bone points: An experimental study. In *Studies in the Upper Paleolithic of Britain and Northwest Europe*, D.A. Roe (ed.). Oxford: Oxbow, pp. 165–173. (BAR; vol. 296).

Bergman C. 1987
Hafting and use of bone and antler points from Ksar Akil, Lebanon. In *La Main et l'Outil. Manches et emmanchements préhistoriques: Table Ronde C.N.R.S. tenue à Lyon du 26 au*

29 novembre 1984, sous la direction de D. Stordeur. Lyon: Maison de l'Orient et de la Méditerranée Jean Pouilloux, pp. 117–126.

Borodovsky A.P. 1997

Drevneye kostoreznoye delo yuga Zapadnoi Sibiri. Novosibirsk: Izd. IAE SO RAN.

Borodovsky A.P., Zubova A.V., Pozdnyakov D.V., Tabarev A.V., Cheremisin D.V. 2010

Arkheologiya nasiliya (interpretatsiya materialov arkheologicheskikh, antropologicheskikh i izobrazitelnykh kompleksov): Ucheb.-metod. posobiye. Novosib. Gos. Univ., Novosib. Gos. Ped. Univ., IAE SO RAN. Novosibirsk: [s.l.].

Bradfield J. 2012

Macrofractures on bone-tipped arrows: Analysis of hunter-gatherer arrows in the Fourie collection from Namibia. *Antiquity*, vol. 86: 1179–1191.

Bradfield J., Brand T. 2015

Results of utilitarian and accidental breakage experiments on bone points. *Archaeological and Anthropological Sciences*, vol. 7 (1): 27–38.

Buc N. 2011

Experimental series and use-wear in bone tools. *Journal of Archaeological Science*, vol. 38: 546–557.

Chapman J. 1999

The origins of warfare in the prehistory of Central and Eastern Europe. In *Ancient Warfare: Archaeological Perspectives*, J. Carman, A. Harding (eds.). Gloucestershire: Sutton Publishing, pp. 101–142.

Cheshier J., Kelly R.L. 2006

Projectile point shape and durability: The effect of thickness: Length. *American Antiquity*, vol. 71: 353–363.

Derevianko A.P., Molodin V.I. 1994

Denisova peshchera. Pt. 1. Novosibirsk: Nauka.

Frison G.C. 1989

Experimental use of Clovis weaponry and tools on African elephants. *Antiquity*, vol. 54: 766–783.

Koni, kolesnitsy i kolesnichiye stepei Evrazii. 2010

V.S. Bochkarev, A.P. Buzhilova, A.V. Epimakhov, L.S. Klein, P.A. Kosintsev, S.V. Kullanda, P.F. Kuznetsov, E.E. Kuzmina, M.B. Mednikova, A.N. Usachuk, A.A. Khokhlov, E.A. Cherlenok, I.V. Chechushkov. Yekaterinburg, Samara, Donetsk, Chelyabinsk: Rifei.

Luik H. 2006

For hunting or for warfare? Bone arrowheads from the Late Bronze Age fortified settlements in Eastern Baltic. *Estonian Journal of Archaeology*, vol. 10 (2): 132–149.

Tabarev A.V. 2005–2009

Delo o spryatannykh nakonechnikakh (klady-tainiki kamennykh izdeliy na territorii Severnoi Ameriki). *Stratum plus*, No. 1: Middle Paleolithic: In Search for Dynamics: 300–333.

Tyzzer E.E. 1935–1936

The "simple bone point" of the shell-heaps of the northeastern Algonkian area and its probable significance. *American Antiquity*, vol. 1: 261–279.

Waguespack N.M., Surovell T.A., Denoyer A., Dallow A., Savage A., Hyneman J., Tapster D. 2009

Making a point: Wood- *versus* stone-tipped projectiles. *Antiquity*, vol. 83: 786–800.

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Woven, Knitted, and Wattled 17th–18th Century Textiles from Tara Fortress, Western Siberia*

During the excavations of Tara Fortress, conducted since 2009, numerous structures and artifacts made of organic materials were revealed in 17th–18th century habitation-levels at a depth of 2.5–4.0 m: remains of wooden dwellings and utility constructions; leather footwear; wooden chess-pieces; children's toys; wooden and birch-bark vessels; churn-staffs; and birch-bark and pine-bark floats. A number of artifacts woven, knitted, and wattled from vegetable fibers and horse-hair, were discovered. They fall into several categories: textiles of linen, twill, and rep weave, ropes and cords, and vessels for storing solids. Their study allowed us to reconstruct the techniques of their manufacture, to compare these artifacts with similar finds from Western Siberia, to assess the conditions of manufacture, and to evaluate the weavers' skills.

Keywords: *Tara Fortress, linen, twill, rep, ropes, cords, textile, technologies.*

Introduction

Analytical studies of clothing and textiles based on available archaeological and ethnological materials represent one of the directions of human cultural research. Specialists in this field have established the North European Symposium for Archaeological Textiles (NESAT). Twelve NESAT forums were held in the period between 1981 and 2014. The latest symposium was held in Austria in 2014. The University of Copenhagen issues an annual scientific journal, *Archaeological Textiles Review*. In total, 57 issues had been released by 2015. In Russia, studies of archaeological textiles are not so popular. However, two noteworthy examples are a special section, "Problems of Study and Reconstruction of Traditional Cultures' Costume", that was arranged at the Symposium "Integration of Archaeological and Ethnographic Studies" held in Kazan in 2010 (Integratsiya…, 2010: 253–462); and also T.N. Glushkova's doctoral thesis (2004). Study of this topic provides information on the social status of the person who used particular textiles, technologies of fabric manufacture, regional features, possible trade links, and many other matters.

Unfortunately, textiles are not often recovered from archaeological sites. However, excavations at the Tara Fortress have yielded numerous remains of woven, knitted and wattled textiles produced from vegetable fibers and horse-hair. The samples were comparatively well preserved, which allowed their analysis.

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Tara Fortress in archaeological studies

Since 2005, the Omsk Division of the Institute of Archaeology and Ethnography SB RAS has carried out archaeological excavations of the Tara Fortress (founded in 1594). The Knyazhya Tower of the fortress (17th–early 19th century), a portion of a mansion in a fortified town (mid-18th–early 19th century), and a side-chapel in St. Nicholas Cathedral (consecrated in 1774) have been excavated. Studies of a mansion belonging to a rich citizen (early–mid-17th century) have been completed. The cultural layer at Tara is up to 4 m thick. During repeated sieges of the fortress by nomadic tribes, citizens had to keep their horses inside, whereby a layer of horse dung was accumulated. This facilitated the preservation of organic materials: basements of wooden dwellings and utility constructions, street flooring, fragments of fence, as well as various objects of wood, bark, leather, textile, knitted and wattled ware. The results obtained from Tara Fortress studies have been published in three monographs (Adaptatsiya…, 2014; Tara…, 2014; Khramy…, 2014).

Data from written sources

Along with archaeological materials, historical data on weaving and textile trade at Tara have been studied. The town was founded as a military and administrative center, with only minor handicraft trade; this is why no textile-production factories existed here till the late 19th century. In 1625, there were only 10 artisans in Tara. The low number is explained by the fact that men belonged mostly to the service class. In addition, the military situation at the Tara Fortress throughout the 17th century benefited development of the crafts related to military services (arms-repair, horse-harness manufacture, construction and renovation of military defenses, etc.) (Tataurov, 2014).

In the beginning of the 18th century, tailors appeared at Tara. By 1720, there were 113 artisans here, including eight tailors and six hatters, while in 1763, there were already 49 tailors. In 1753, a hat-factory was founded by Tara merchant Vasily Medovshchikov, where hats were manufactured of lamb's wool and woolen cloth. But in 1773, this factory was burnt down (Tara…, 2014: 101–103).

In the late 18th–19th centuries, features of agriculture were developed in the Tarsky Uyezd that were associated with the production of raw materials for weaving; and then, weaving itself was established. In nearly all villages of the region, the manufacture of linen, ropes, threads, tablecloths, and towels has been recorded. Tatars also produced these items (Ibid.: 133).

The situation with woolen knitted and felt ware was different. From the time of the town's foundation, its citizens raised sheep; thus, there was always a good supply of wool, and the woolen clothing of people was self-made. Felt was produced by citizens of the Bukharan district (founded in the early 17th century) at Tara. The available list of goods imported from Central Asia by Bukharans does not include either felt or woolen cloth; hence, these items were likely brought to Tara as gifts, with other immigrant belongings, and were also produced in Tara.

Initially (approximately until the 1740s), the Tara service class did not have any uniform; hence, there are no grounds by which to identify the fabrics that might have been used for uniform manufacture. Unmounted Cossacks and riflemen wore their own clothes. No state supply of fabrics and clothing to Tara existed. The Tara military post began to wear uniforms only in the mid-18th century.

Clothes and shrouds were provided in Tara by the state only for clergy. Thus, after the fire in the Pyatnitsky church in 1631 (Strogova, Tataurov, 2012), the following things were delivered: "rich phelonia, green shoulder coverings, ciselé velvet on red base, black silk, an epitrachelion and epimanikia made of the same velvet, silver buttons, two phelonia of cotton fabric, shoulder coverings of colored velvet, two epitrachelia and two epimanikia of the same velvet, a sticharion under phelonion of cotton fabric, colored velvet shoulder covering, two sticharia under phelonion of plain cloth, shoulder covering of cotton velvet, and three woven belts decorated with red and green silk with tassels, two woven belts of knitted cotton… with tassels, as well as veils and aers on three holy vessels, and in their middle there is Qizilbash damask, and near that they bear the decoration of blue Qizilbash damask; and two veils and aers of Qizilbash damask, and thirty three arshins of linen for three altar strachitsas, and over ten arshins of colored velvet for three inditias, and twenty six arshins of blue colored homespun cloth, and almost four arshins of cotton fabric for the crosses on three eiletons and inditions" (RGADA. F. 214, Inv. 1, D. 31, fol. 181).

Tara was a large transit-center in the trade routes to China and Central Asian states. Merchants brought here various fabrics, including Chinese and Central Asian silk, which was in constant demand. Such textiles have represented typical finds during excavations of Tatar burial grounds of the 17th–18th centuries (Tataurov, Tikhonov, 1996). By the middle of the 17th century, Tara market had become oriented towards ready-made goods: gunpowder, broadcloth, paper, copper wire, axes, sickles, needles, mirrors, etc. The Russian product-list included various sorts of fabrics, clothes, household items, and other things. The majority of these goods were industrially manufactured (Bashkatova, 1994).

On the basis of available written records, the textile's remains, which were discovered in archaeological layers dating to the 16th–18th centuries, can be subdivided into two main categories: imported and home-made.

The Tara collection of woven, knitted, wattled, and twisted goods

The samples were recovered during the study of a rich citizen's mansion. The finds were located in the space between the dwellings, at a depth of about 3 m from the daylight surface (construction horizons 4 and 5 dating to not later than early 18th century). All building structures of the mansion were damaged by fires, and goods made of organic materials have not survived. But the areas between structures, especially if the roads passed there, were mostly wet and dirty at the time of their use. Therefore, goods made of organic materials were mostly preserved outside the dwelling structures. All these items were thrown away as garbage. However, they can be used as samples for the analysis and description of textiles. In total, 68 pieces were studied: 31 woven, 7 knitted, and 30 wattled and twisted pieces. Technological study of textile fragments (including visual inspection, materials and structural analysis of samples, search for technological parallels, and reconstruction of textile manufacture techniques) was performed according to the developed methodology in the Laboratory for Historical Studies of the Surgut State Pedagogical University (Metodika…, 2011). Available textile samples were classified into four main categories.

Woven materials. There are woolen fabrics of linen (Fig. 1, 2) and twill (Fig. 3) weave. The majority of samples demonstrate twill weaving. All samples of twill fabrics (even-sided twill 2/2) were woven of similar

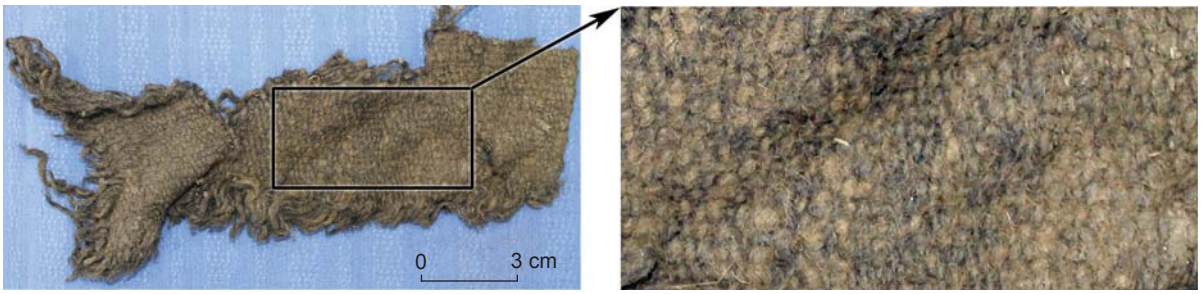

Fig. 1. Coarse woolen linen weave fabric.

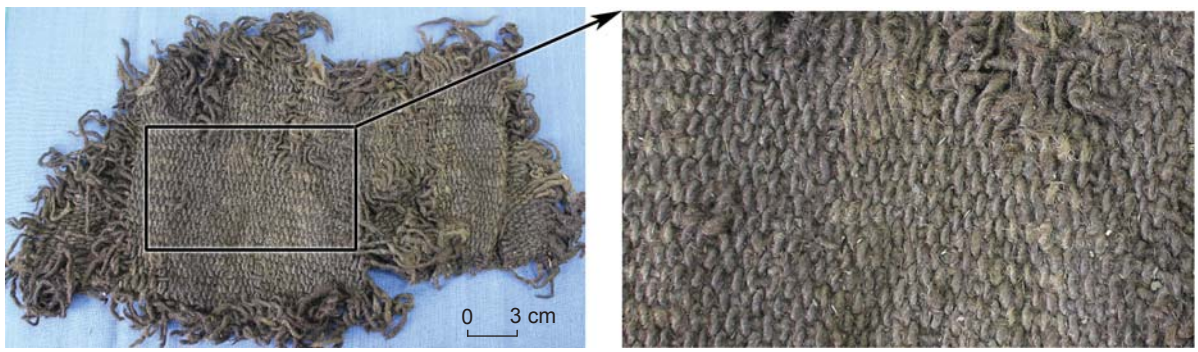

Fig. 2. Striped coarse woolen linen weave fabric.

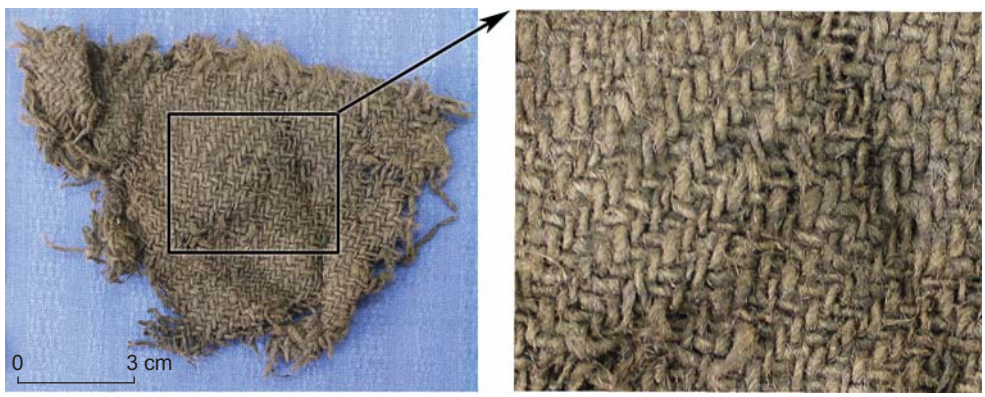

Fig. 3. Twill weave fabric (twill 2/2).

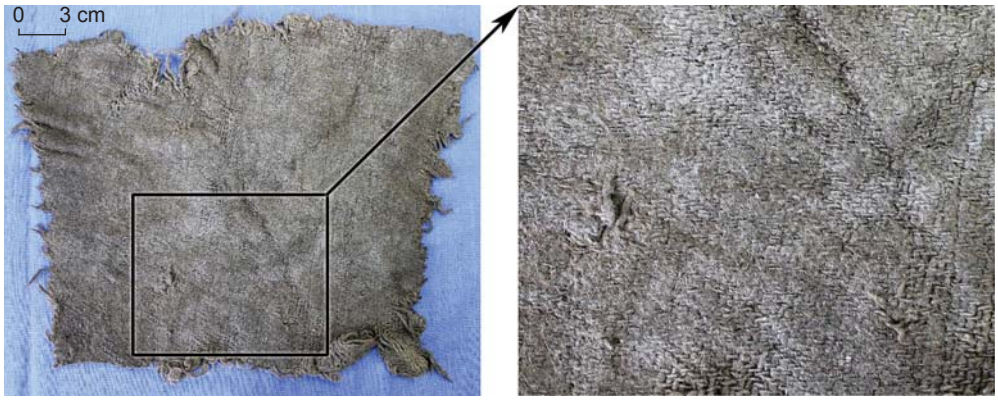

Fig. 4. Broadcloth showing nap damage.

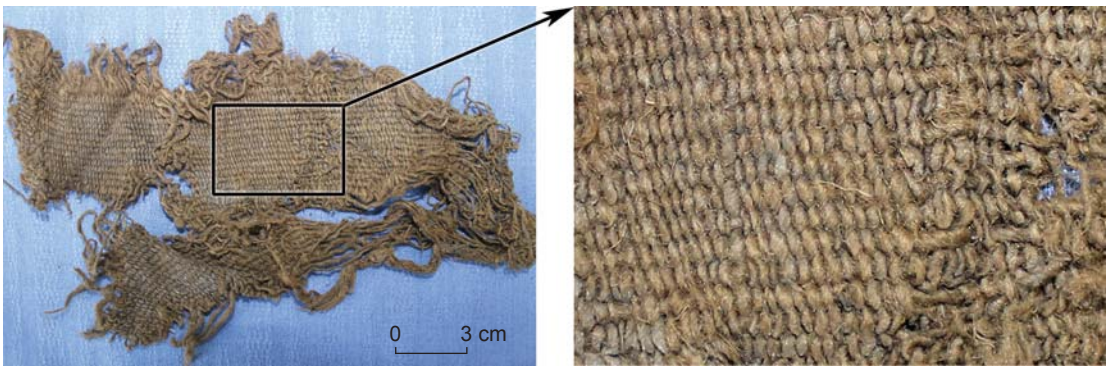

Fig. 5. Woolen linen weave fabric with rep effect.

Fig. 6. Woolen stocking knitted with one needle.

Z-spin warp and weft threads 0.8 to 1.0 mm thick, and have regular density from 7–8 to 10–11 threads in 1 cm. These fabrics were manufactured of wool of natural color.

Woolen fabrics of linen weave include textiles with thin and homogeneous threads representing the structure associated with broadcloth production technologies (Fig. 4), where the warp and weft threads are spun in opposite directions (Z/S). Some samples with this structure were made of thick and rough home-made threads. However, there are also very simple textiles with similar warp and weft threads of Z-spin. One sample shows weaving of thin even threads of S-spin, forming a dense and thin cloth. Another sample demonstrates a linen-weaving pattern with rep effect (Fig. 5): the warp and weft threads are uniform, but the density varies depending on the thread direction.

Knitted materials. All items of this type are similar. They are knitted with one needle of double twisted

threads with the complicated Z2S structure. The samples show missing parts, ruptures and cut marks that make it possible to identify the knitting techniques and the cloth production features. Well-preserved sections allow technological features to be identified. The collection of knitted pieces includes woolen stockings (Fig. 6), and a fragment of a cut knitted cloth in the form of a shoe's insole (Fig. 7) (secondary use of textile).

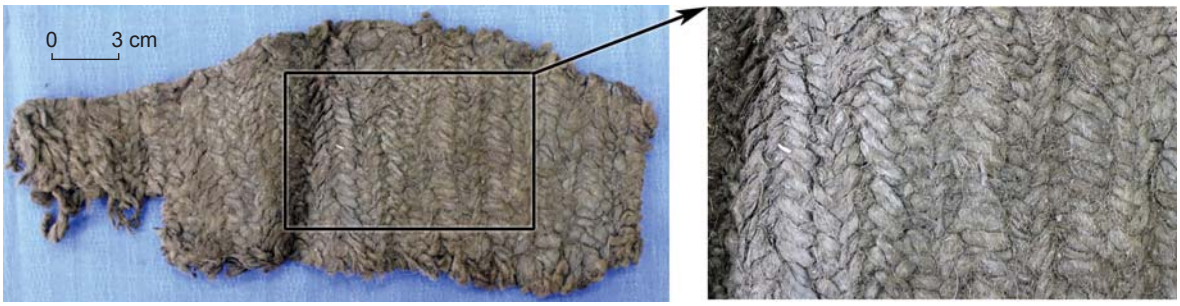

Fig. 7. Insole made of a woolen item knitted with one needle.

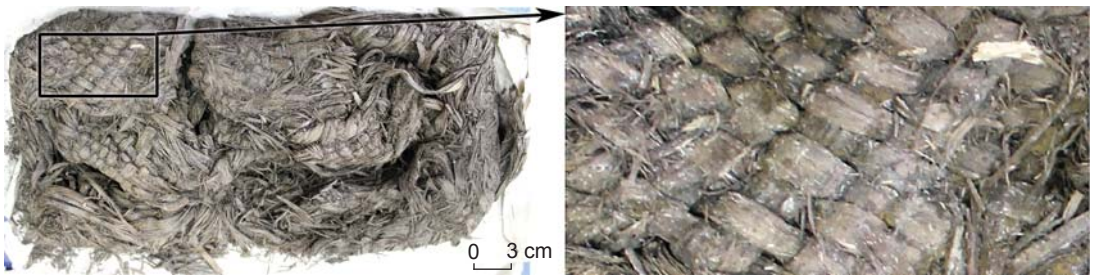

Fig. 8. Container wattled of bast fibers.

Fig. 9. Rope plaited of vegetable fibers.

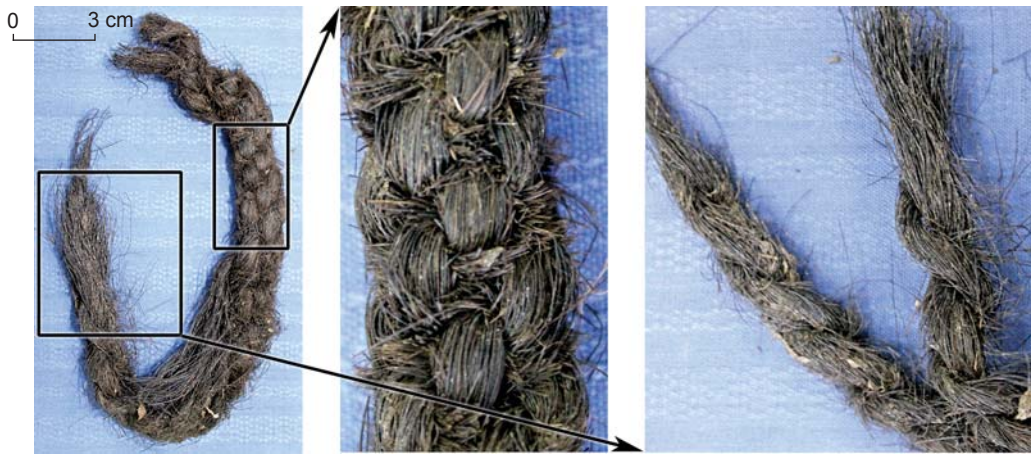

Fig. 10. Rope with a complicated twisting pattern.

Wattled materials. These include a container wattled of vegetable fibers of the bast type 5 to 7 mm wide (Fig. 8) and a four-edged braided cord of horse-hair, which was made on five fingers using a "pulling" technique.

Twisted materials: cords and ropes. These items were produced with a simple technique of twisting with two "threads" (Fig. 9) or twisting of several strands in opposing directions (Z2S, Z3S, Z4S) (Fig. 10). Cords and ropes were mostly made of vegetable fibers, yet some specimens were manufactured of woolen threads and horse-hair.

Discussion

The described materials represent a variety of textile technologies.

The first textile tradition is a technology of broadcloth fabric manufacture, which has been used in Russia since the 16th century (Nakhlik, 1963). The technology is based on the use of threads spun in opposite directions (Z/S) in warp and weft structures of linen weave, with equal density of threads in both structures. Fulling of cloth through such technique makes it possible to produce a dense and even nap on both sides of the textile fabric, which is an essential condition in producing warm and wind-proof clothes. Broadcloth meets this requirement in the best way. In addition, it does not let the moisture go through even when the cloth gets wet. Thus it is not surprising that broadcloth was a popular fabric in Siberia. The following equipment and materials are necessary for manufacture of broadcloth: a horizontal weaving loom that ensures even cloth density; threads specially prepared to be used as warp and weft threads; and appliances for fulling (special room or basin and hot water). But most important are good production skills. In order to produce thin (and often dyed) broadcloth fabric with even and regularly spun threads and even density without weaving errors, a certain specialization was needed, which apparently was initially absent in Tara. Hence, it is generally believed that such a textile tradition did not exist in Siberia in the 17th–18th century, and the great bulk of such textiles was imported from the European part of Russia (Bakhrushin, 1952: 91–92). The technology of production of low-quality coarse heavy cloth was widespread in Western Siberia as early as in the late 17th century (Vilkov, 1967: 85); so, from that time forward, it could have been manufactured locally. It was unreasonable to import the low-quality textile for trade, given the high costs and low profit.

The second textile tradition represents the technology of manufacturing fabric of linen-weaving pattern, with the warp and weft threads belonging to a similar spinning type. The tradition can be subdivided into several variants. Variant 1 implies ordinary woolen fabrics of linen weave with Z-spin threads. This is usually the comparatively coarse textile manufactured of home-made threads. Such fabric can represent, for example, a piece of cloth resembling footwraps. Variant 2 differs from Variant 1 by its rep effect: the density of either warp or weft threads is at least twice as high as in the other structure. Variant 3 includes high-quality fabrics made of thin and even warp and weft threads of a single spin, with the density equal and comparatively high in both directions. Fabrics of this type were most likely produced in textile mills or in handicraft centers.

For production of linen-weave fabrics, the upgraded looms were used in combination with the developed textile manufacture tradition (textile made of thin and even threads, high density of warp and weft threads, without weaving errors), and also simple appliances in the presence of certain weaving skills and the absence of specialization (fabrics with thick and unevenly spun threads, with low and uneven density of warp and weft threads, and frequent weaving errors).

The third textile tradition represents fabrics of twill-weaving pattern. Some twill samples show weaving errors that suggest either low weaving skills, or the use of simple appliances. However, stable technological features of this textile-type, such as the warp and weft threads of Z-spin with similar thickness and the stable structure of even-sided twill, indicate its mass-production in the comparatively simple conditions suitable for a peasant household. The stable density of warp and weft threads (from 7 to 10–11 threads per 1 cm) attests to the use of a standard loom—most likely horizontal—while slight deviations suggest that looms with various combs of similar construction were used. Twill weave fabrics were broadly used in Russia and Siberia in the 16th–19th centuries; any chronological differences in the technological features are absent (Novgorod, Mangazeya, Tobolsk, Staroturukhansk, and the sites of Tomsk-Narym regions of the Ob) (Nakhlik, 1963; Vizgalov et al., 2006; Matveyev, Glushkova, Anoshko, 2011; Glushkova, Shulaeva, 2013). Thus, the analysis of twill weave fabrics indicates their mass production, and a stable textile tradition of manufacturing xeven-sided twill.

The items knitted with a single needle of woolen threads of various thicknesses show very similar structure. This may point to a common production-technique.

It should be noted that the amount of goods twisted of vegetable fibers is large, while fabrics made from vegetable materials are not recorded. This can be explained by the structural features of flax, hemp, nettle, and cotton fibers, which decay quickly without saturation with metal oxides, and also by the secondary use of such textile owing to its good hygroscopic properties (durable secondary use as dusters for household purposes). This

leads to great wear and rapid decay in soil during the period of archaeologization.

Considering the great variety of vegetable materials, the uniformity of manufacture of twisted cords and ropes is noteworthy. The thickness and strength of these items depends on the number of single elements of the structure. The purpose of the items is also important.

A special find was the four-edged braided cord twisted of horse-hair, which should most likely be attributed to the culture of nomadic and pastoralist groups of southern regions.

Conclusions

The recovered textile objects vary in terms of threads, weaving patterns, and surface texture; but the samples do not contain the expensive imported fabrics known from historical records of the 17th century (Katalog…, 2013). The noted distinctions in textile traditions suggest that fabrics could have been produced in various manufacturing centers. Hence, the Tara textile collection includes both locally produced and imported fabrics. These are apparently textiles of higher quality of linen and twill weave.

The Tara collection includes materials that are well known in other regions of Siberia (for example, woolen even-sided twill). This probably attests to their production using the same technology in various regions populated by Russians. It can be assumed that home-made coarse heavy cloth and thick, coarse, striped fabric, resembling footwraps, were produced locally.

The archaeological materials obtained during the excavations in Tara Fortress provide the evidence that in the 17th–early 18th century, manufactured fabrics were mostly imported here from the European part of Russia. At that time, there was no regular (state) supply of uniforms or other outfits for service people. Till the mid-18th century, Tara was a military and administrative center; therefore no local weaving industry was developed here. The fabrics from local production represented home-made goods.

Tara citizens used to wear knitted woolen goods, like socks, stockings, various undergarments, etc. These items could have been knitted locally, and this tradition has survived until the present. Among the goods that were delivered to Tobolsk in the 17th century, O.N. Vilkov identified a great amount of knitted and broadcloth stockings (1967: 103), but he did not describe their types. In the 17th century, goods knitted with one needle were used in Mangazeya and Staroturukhansk. Excavations in Tobolsk revealed socks knitted with five needles (Vizgalov et al., 2006; Glushkova, Shulaeva, 2013; Matveyev, Glushkova, Anoshko, 2011). The Tara stockings are fine, carefully knitted of high-quality threads, and may have been imported.

Increasing growth of industrial crops (mostly flax) in the late 18th–19th century contributed to the development of weaving in settlements and villages of the Irtysh basin. The home-made goods were sold at local fairs, and were used by the urban population for clothing and household decoration.

Thus, the results of the study provide finer detail for the information from written sources about technological features and attribution of textiles, local textile production, and imported fabrics in Tara in the 17th–18th centuries.

References

Adaptatsiya russkikh v Zapadnoi Sibiri v kontse XVI – XVIII vekakh (po materialam arkheologicheskikh issledovaniy). 2014
L.V. Tataurova, S.F. Tataurov, F.S. Tataurov, K.N. Tikhomirov, S.S. Tikhonov. Omsk: Izdatel-Poligrafist.

Bakhrushin S.V. 1952
Nauchnye trudy. Vol. 1: Ocherki po istorii remesla, torgovli i gorodov Russkogo tsentralizovannogo gosudarstva XVI – nachala XVII v. Moscow: Izd. AN SSSR.

Bashkatova Z.V. 1994
Torgovlya goroda Tary v seredine XVII v. In *Tare – 400 let: Problemy sotsialno-ekonomicheskogo osvoyeniya Sibiri: Materialy nauch.-prakt. konf. "Istoriya i krayevedeniye. Tara i goroda Sibiri i Rossii"*, pt. 1. Omsk: pp. 189–192.

Glushkova T.N. 2004
Arkheologicheskiy tekstil kak istochnik po rekonstruktsii tkachestva Zapadnoi Sibiri. D.Sc. (History) Dissertation. Barnaul.

Glushkova T.N., Shulaeva A.N. 2013
Sravnitelnaya kharakteristika tekstilnykh materialov iz Mangazei i Staroturukhanskogo gorodishcha (XVII v.). In *Arkheologia Severa Rossii: Ot epokhi zheleza do Rossiyskoi imperii: Metarialy Vseros. nauch. arkheol. konf. (Surgut, 1–4 okt. 2013 g.)*. Yekaterinburg, Surgut: Magellan, pp. 238–242.

Integratsiya arkheologicheskikh i etnograficheskikh issledovaniy. 2010
Pt. 1. Kazan: Institut istorii im. S. Mardzhani AN RT.

Katalog tkanei, bytovavshikh v Rossii i Sibiri v XVII–XIX vv. (istoriko-tekhnologicheskoye opisaniye). 2013
Glushkova T.N., Shulaeva A.N (eds.). Tyumen: Aksioma.

Khramy v krepostnykh stenakh: Konfessionalnaya istoriya goroda Tary. 2014
O.Y. Alferova, S.A. Alferov, E.I. Kudryashova, S.F. Tataurov (eds.). Omsk: Izd. dom "Nauka".

Matveyev A.V., Glushkova T.N., Anoshko O.M. 2011
Ostatki tekstilnykh izdeliy v materialakh raskopok na Verkhnem posade Tobolska. In *Ekologia drevnih i traditsionnyh obschestv*, iss. 4. Tyumen: Izd. IPOS SO RAN, pp. 218–220.

Metodika issledovaniya arkheologicheskogo tekstilya (opyt obobshcheniya). 2011
Nauch.-metod. posobiye. Glushkova T.N., Elkina A.K., Elkina I.I. Surgut: Surgut. Gos. Ped. Univ.

Nakhlik A. 1963
Tkani Novgoroda. *MIA*, No. 123: 228–253.

Strogova E.A., Tataurov S.F. 2012
Istoriya odnogo pozhara. In *Sotsialno-ekonomicheskoye razvitiye i istoriko-kulturnoye naslediye Tarskogo Priirtyshya: Materialy VI region. nauch.-prakt. konf., posvyashch. 120-letiiu so dnya rozhdeniya A.V. Vaganova (g. Tara, 1–2 marta 2012 g.)*. Omsk: Amfora, pp. 72–77.

Tara v XVI–XIX vekakh – rossiyskaya krepost na beregu Irtysha. 2014
S.A. Alferov (ed.). Omsk: Amfora.

Tataurov S.F. 2014
Gorod Tara kak voyenno-administrativnyi, ekonomicheskiy i kulturnyi tsentr razvitiya Priirtyshya v kontse XVI – pervoi polovine XVIII vv. In *Kultura russkikh v arkheologicheskikh issledovaniyakh*, vol. 1. Omsk, Tyumen, Yekaterinburg: Karavan, pp. 176–180.

Tataurov S.F., Tikhonov S.S. 1996
Mogilnik Bergamak II. In *Arkheologo-etnograficheskiye kompleksy: Problemy kultury i sotsiuma (kultura tarskikh tatar)*, vol. 1. Novosibirsk: Nauka, pp. 58–84.

Vilkov O.N. 1967
Remeslo i torgovlya Zapadnoi Sibiri v XVII veke. Moscow: Nauka.

Vizgalov G.P., Parkhimovich S.G., Glushkova T.N., Kireyeva E.V., Sutula A.V. 2006
Early 17th-century textiles from Mangazea. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 1 (25): 117–131.

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Ceramics from Novoilyinka III, a Chalcolithic Site in Kulunda, Western Siberia*

Chalcolithic ceramics from Novoilyinka III in Western Siberia (early 3rd millennium BC) were analyzed in terms of manufacturing technology and decorative techniques, with especial regard to tools for applying decoration. Two ornamental traditions relating to the selection and processing of paste are described. The typical tradition was the use of low-ductility ferrous clay tempered with fine sand, down, and organic matter. The less-common practice was to use high-ductility clay tempered with grit and grog, but not down. In decoration as well, two traditions are evident. Most vessels tempered with down are decorated with non-comb imprints such as pits. Vessels made of low-ductility clay and tempered with grit and grog (but not down) are mostly decorated with comb-imprints. The latter technology, evidently attesting to a blend of traditions, is unusual, and is paralleled by the ceramics with comb-pit, pit-comb, and retreating-pricked-pit decoration distributed from the forest zone of Eastern Europe to the Upper Ob. The closest resemblance is seen with ceramics of the Bairyk and Kiprino types, from Baraba and the Upper Ob respectively. The distinctiveness of the Novoilyinka III pottery may be explained by the peripheral (easternmost) position of the site within this community.

Keywords: *Chalcolithic, Western Siberia, ceramics, technological analysis, decoration.*

Introduction

Any discovery of a new archaeological site attributable to the Neolithic and Chalcolithic periods in the south of Western Siberia provides a new insight into the history of these periods. The site of Novoilyinka III has been discovered in the Kulunda steppe that is located at the crossroads between large archaeological areas of the Altai steppe, Kazakhstan, and the Baraba steppe. Novoilyinka III is among the few well-stratified sites discovered in the region. Studies at the site provide important information on the ethnic and cultural processes existing in the south of Western Siberia as early as in the Chalcolithic period.

Novoilyinka III (Fig. 1) was discovered by S.M. Sitnikov in 2004, and an area of approximately 40 m^2 was excavated in 2005–2006 (Kiryushin K.Y., Sitnikov, 2009: 101). The area excavated in 2010–2014 reached 608 m^2. Archaeological finds including ceramics, stone artifacts, and animal

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Fig. 1. Location of the site of Novoilyinka III.

bones, were concentrated over the area of 360 m^2 in the central part of the excavation site, and around the spot of burnt soil in the eastern part of the site. In the central part, archaeological finds were associated with the patches of sandy loam with amorphous borders in both horizontal and vertical directions. The fragments belonging to particular vessels were distributed at depths of 0.35 to 0.85 m, while potsherds belonging to the vessels of various morphological and ornamentation classes were embedded in a single layer. The Novoilyinka III lithic industry was based on flakes; no traces of blade-based reduction typical of the Chalcolithic have been noted. A series of radiocarbon dates has been obtained on the recovered animal bones: 4270 ± 170 BP (Le-7534), 4585 ± 170 BP (SOAN-8318), 4310 ± 110 BP (SOAN-8319), and 4250 ± 120 BP (SOAN-8320), suggesting a date of the middle-second half of the 3rd millennium BC. The calibrated dates make the age of the culture-bearing layer nearly one thousand years older. The values spread by 1σ (probability of 68.2 %) are within the range of 3650–3600 to 2650–2630 BC, those by 2σ (95.4 %) 3700–2850 to 3500–2400 BC. The maximum spread of values is 1020–1300 years, while the minimum is 650–950 years. This interval is quite considerable. It is most likely that the culture-bearing layer was accumulated over a shorter period. The calibrated radiocarbon dates suggest the date of the Novoilyinka III materials to be the first half of the 3rd millennium BC (Kiryushin K.Y., 2015: 26).

The unique ceramic collection, including a few thousands of potsherds belonging to at least 60 vessels, was recovered from Novoilyinka III. The original shapes of 18 vessels were partially or completely reconstructed. The rim-diameters are usually slightly smaller than those of the vessels' bodies; the bases are pointed or rounded (Fig. 2). Vessel-walls were thoroughly smoothed over, so that any traces of mineral admixtures are not detectable on the surface. The walls are 6–7 mm thick on average; some vessels had walls 5 or 8–9 mm thick. The vessels were manufactured using the patch technique (Fig. 3). This ceramic set is unusual for Altai in both ornamentation patterns and paste composition.

The Novoilyinka III ceramic collection represents an important source of information about the ancient population, and has been subjected to various analyses. The study of ceramic-manufacturing technique provides information about human migrations, subsistence strategies, contacts between tribes, exploitation of new territories, and other matters. The Novoilyinka III collection was studied with the historical and cultural approach proposed by A.A. Bobrinsky (1978, 1999). The main purpose was to identify specific features of cultural traditions relating to raw material selection, paste preparation, and vessel ornamentation. The authors address the following issues: 1) identifying cultural traditions in the skills of raw material selection and paste preparation; 2) distinguishing between local and foreign techniques; 3) identifying the features suggesting a blend of traditions; 4) exploring the features of shaping a tool's working edge, and techniques of pottery decoration. Fresh breakages and potsherd-surfaces were examined using a binocular microscope MBS-10. Examination of raw materials was focused on determination of the iron-admixture in clay, the characteristics of coarse admixtures in clay, and cases of using one or two different sorts of clay. Iron-admixtures in clay were determined through potsherd-heating in oxidizing medium in a muffle furnace at 850 °C. Analysis of ornamentation-patterns was focused on reconstruction of the tool's working edge by its imprints, on features of the working edge's formation, and on techniques of applying decoration. Analytical data have been supported by experiments.

Results of technical and technological analysis

Wall and rim fragments of 19 vessels were subjected to technical and technological analysis. These ceramic

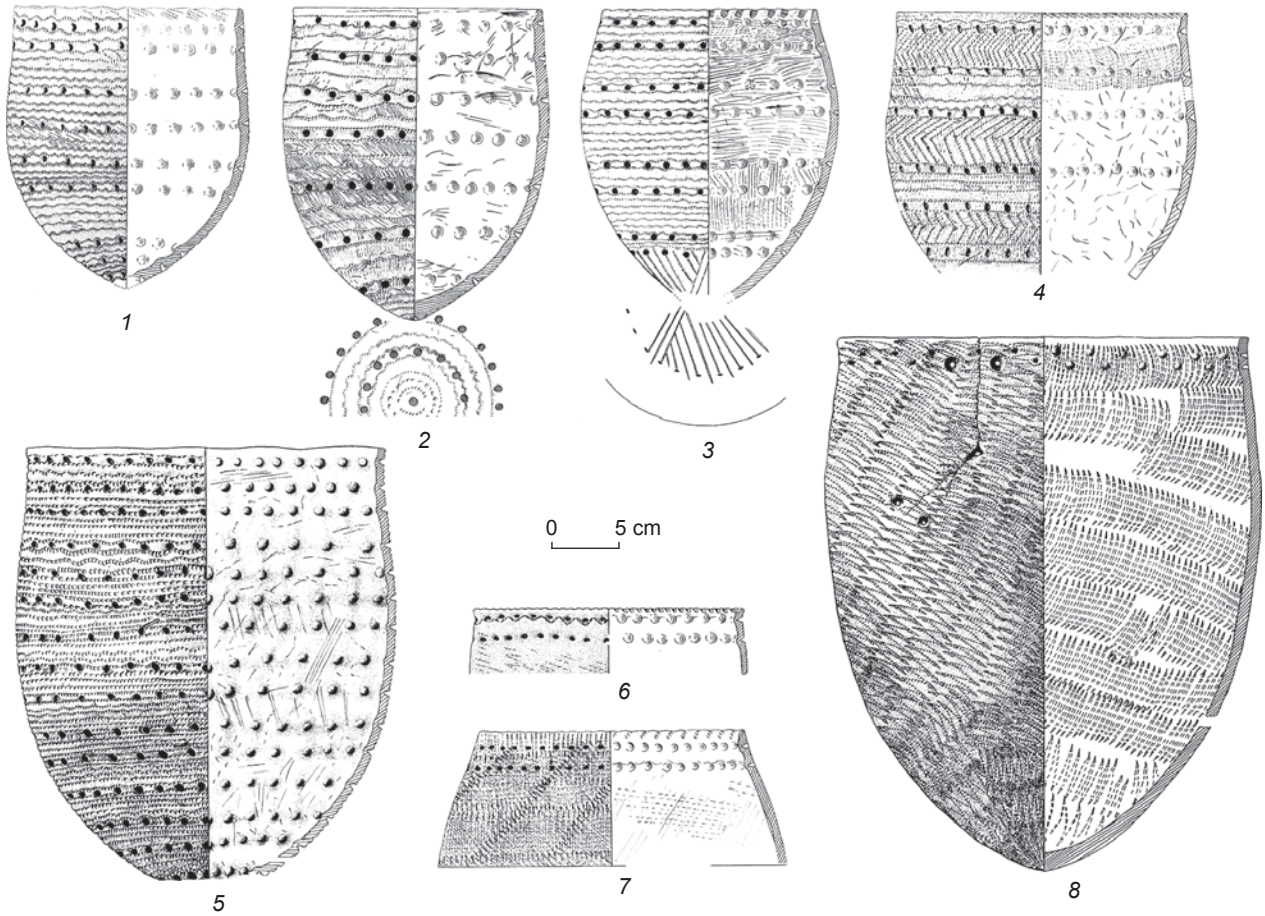

Fig. 2. Graphic reconstructions of the Novoilyinka III ceramic vessels.

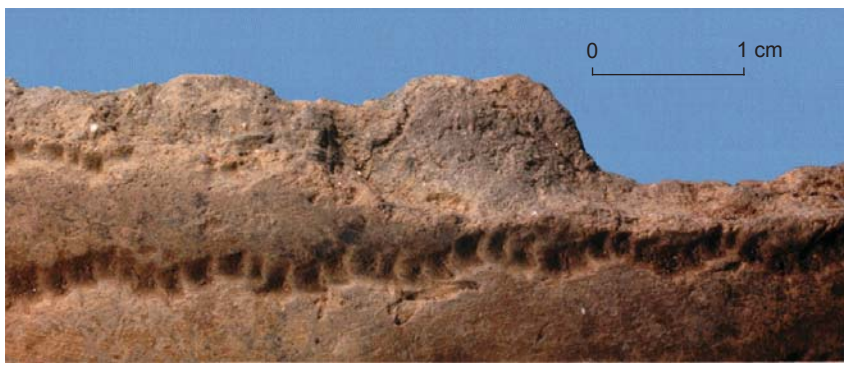

Fig. 3. Vessel-fragment with the traces of patch technique.

fragments varied in ornamentation-patterns and colors, and were apparently baked in fire at low temperature.

Raw materials. Pots were made of ferrous, mostly low-ductility clay tempered with fine river-sand. The clay used varied in concentration and size of admixtures. Quartz sand with a particle size of less than 0.5 mm was observed, mostly; yet some specimens contained larger sand-grains, up to 1 mm. A sand-ratio of 1 : 2 to 3 is most typical, although some specimens demonstrate a sand-ratio of 1 : 4. The share of vessels made of ductile clay is 10.5 % of the total number of vessels. Comparative analysis of the used raw materials has shown that clay from several beds was used; the features of the clay are mostly homogenous in iron content, but vary in the amount of natural admixtures. The main (local)

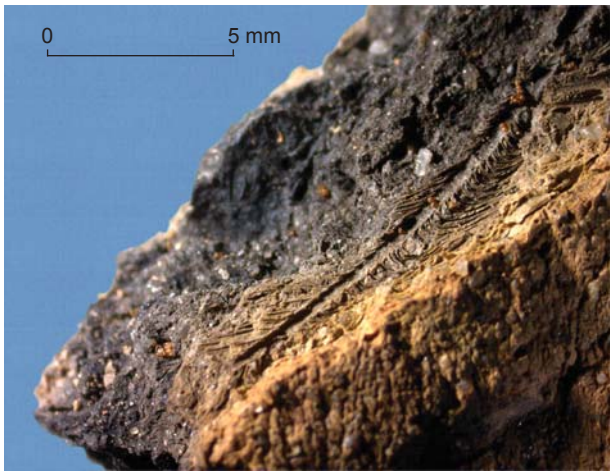

Fig. 4. Imprints of bird-down on the vessel-wall.

Novoilyinka III tradition was the use of ferrous, low-ductility clay tempered with fine river-sand.

Paste. Three main paste compositions were identified: clay + down + organic matter (89 %); clay + grog + grit + down + organic matter (5.5 %), and clay + grit + organic matter (5.5 %). The main paste-type 1 includes two sub-types: based on the low-ductility clay (84 %), and based on the ductile clay (5 %). Only one vessel was made of paste that did not contain down (5.5 %); only two vessels (11 %) contained mineral admixtures (grog and grit). In both vessels, grit represents granite with a high mica-component. Mineral admixtures were added to the ductile and medium-ductility clays. One specimen shows grit-grains in grog, suggesting a blend of various cultural traditions. In general, the intentional introduction of mineral matter is not typical of the Novoilyinka III ceramic tradition.

Despite the various noted paste types, the main pottery manufacturing traditions at Novoilyinka III can be regarded as local (Bobrinsky, 1978: 67–113). This concerns the use of the low-ductility clay in ceramic paste with the admixture of down and some organic matter, most likely bird-droppings (Fig. 4). The non-local traditions show the use of ductile clay, grog, and grit, but the absence of down. The clay paste composition of clay + grog + grit + down + organic matter represents a blend of a non-local tradition (using mineral admixtures) and the local tradition (using organic admixtures).

Decoration

All vessels are decorated. Most vessels bear decorations all over the exterior surface, from the rim to the base (see Fig. 2), excluding three specimens. The most typical designs are horizontal straight and wavy lines made using mostly non-comb tools (up to 90 %). Few vessels show vertical and slanting lines (see Fig. 2, *7*, *8*). Another typical motif represents lines of small pits (sometimes, double lines of pits). Some vessels show zigzag mutual positioning of pits belonging to parallel lines. Bases also often bear special decorative motifs, for instance, a ray motif (see Fig. 2, *3*). Decoration-patterns are based on linear compositions: rows of straight and wavy lines; geometrical figures separated by these rows; lines of herringbone images; ornithomorphic images; and straight and wavy lines. In one case, the vessel was decorated with triangles located checkerwise (Kiryushin K.Y., 2015).

The majority of vessels bear imprints of non-comb tools; only few were decorated with comb-implements. The collection has a specific feature: the interior wall-surfaces of some vessels were ornamented with comb-imprints (see Fig. 2, *4*, *8*). Cord-imprints seem to represent another decoration-pattern of the interior walls (see Fig. 2, *7*; 5). It should be noted that 56 % of the rims show other types of interior decoration; the motifs are: 1) short slanting lines (incisions) executed with tools having both smooth and comb working edges; 2) horizontal lines of varying length in depressions, made sometimes with a stick braided with cord and, in other cases, with a finger (see Fig. 2, *1*, *3*, *4*, *6*, *7*) (Ibid.: Fig. 22). The vessels look variously ornamented owing to specific decorative techniques. The potters' skills are remarkable: they are reflected in the locations of imprint-lines and the general uniformity of the arches of the wavy lines, the difference between the arch-sizes being around 1–2 mm (Fig. 6).

On the basis of the imprints of ornamenting-tools, decorative techniques, and only partially, the shapes of the working edges have been reconstructed.

Non-comb tools, according to their imprints, usually were 2–4 mm in cross-section. Several varieties of the working-edge shape can be recognized according to the imprint-forms:

1) rounded imprints suggest the corresponding shape of the working edge (Fig. 7);

2) sub-oval and pointed-elongated imprints—a similar working-tool edge (Fig. 8);

3) crescent-shaped imprints are most typical of this ceramic collection; they could have been made using a specially-cut-off tool with a circular cross-section; the imprints vary in depth and diameter (see Fig. 6, 9);

4) pseudo-comb imprints were likely made using the ornamenting tools with uneven working edges

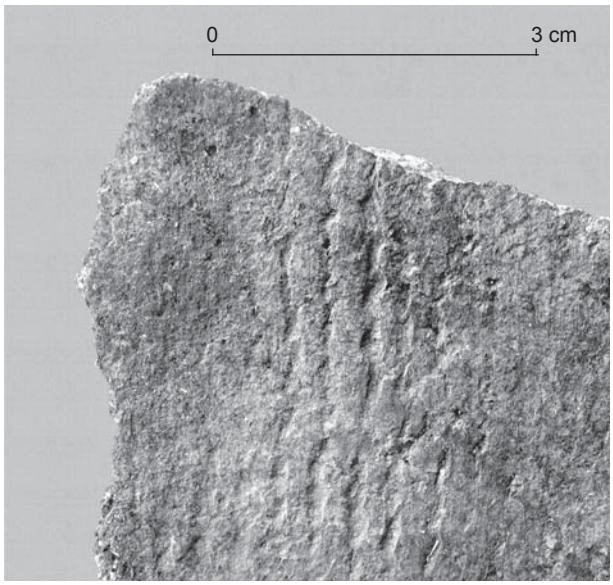

Fig. 5. Potsherd bearing cord-imprints on the interior surface.

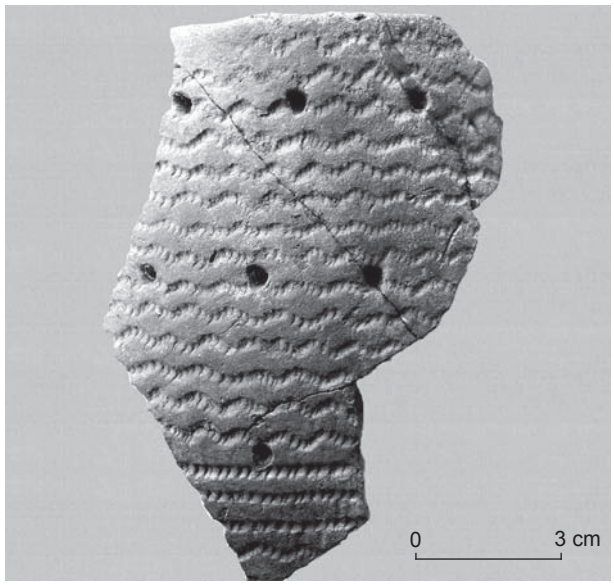

Fig. 6. Vessel-wall decorated with non-comb imprints.

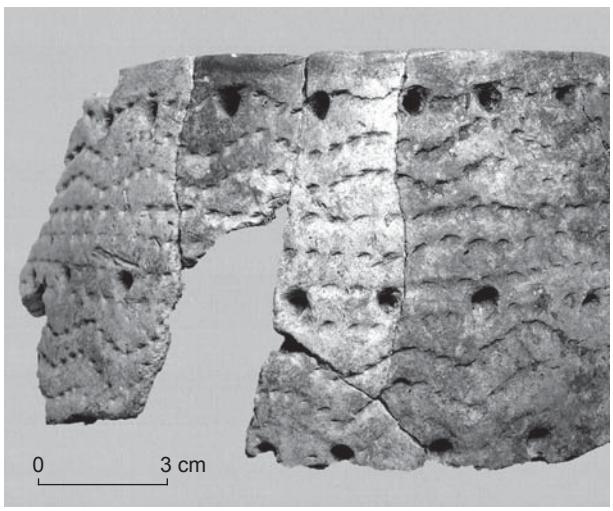

Fig. 7. Vessel-wall decorated using a non-comb tool with a rounded working edge.

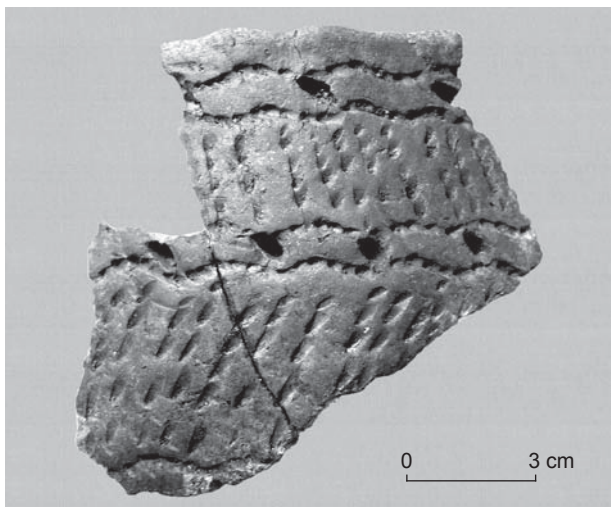

Fig. 8. Vessel-fragment with sub-oval and pointed-elongated imprints.

(Fig. 10). It cannot be excluded that these are traces of animal-teeth. However, experiments with animal-teeth and mandibles did not produce completely analogous imprints (Kalinina, 1991, 1998, 2009: 97; Kazakov, Galchenko, Stepanova: 1994).

Few imprints resembling cord have been noted. However, clear identification is extremely difficult because of the poor state of preservation of the vessel-walls (Fig. 11).

Pits have been observed on all vessels, excluding one specimen. They are rounded, oval, and crescent-shaped; and have sizes of mostly 5–6 cm and 5 × 4 cm. Few pits are 3 × 2 cm or smaller. Their depth is 5–6 cm, and sometimes they are through. Their vertical sections are mostly cone-shaped. Pits were made using various tools, mostly rounded (more rarely, sub-oval) in cross-section (see Fig. 2, 6–8, 11). Pits were formed after the other ornamentation had been executed.

Various decorative techniques were used. Retreating and pricking ornaments were executed using non-comb tools (see Fig. 6–8) (Kalinina,

Fig. 9. Ceramic fragment with crescent-shaped imprints.

Fig. 10. Vessel-fragment with pseudo-comb imprints.

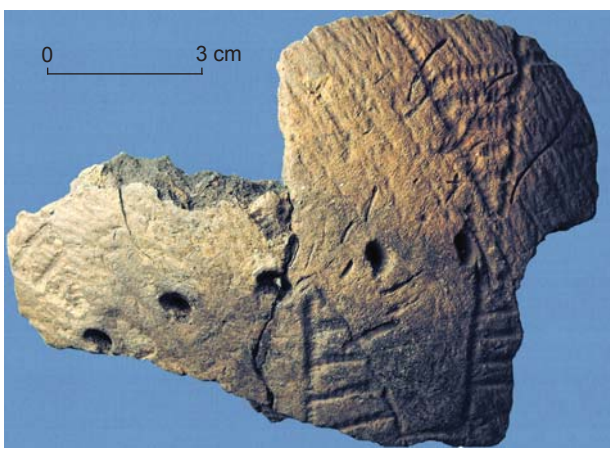

Fig. 11. Vessel-fragment with cord-imprints.

Ustinova, 1990: 15–18, fig. 5, 6). The cases of transition from one decorative technique to another on one vessel have been noted. For instance, pricking was replaced by retreating. The position of the working-tool also varies across the sample: the working edge was either parallel to the rim edge (see Fig. 7); or perpendicular (see Fig. 6), which was most popular. According to decorative techniques and working-edges of tools, sets of two or three similar vessels can be identified (see Fig. 6, 12); although the selection of raw materials might have been different.

Comb-tools were used for ornamentation of six vessels: three vessels demonstrate decoration of their exterior surfaces (see Fig. 2, *6–8*) and five vessels, interior surfaces (see Fig. 2, *4*, *8*; 13). Stepping and rocking stamps were noted on four vessels (see Fig. 2, *6–8*; 14), rolling and stepping with dragging, on one vessel each (see Fig. 13). The length of the imprints varies from 3 to 7 cm. One of the vessels in the collection bears the imprints of two different tools (or one tool with two working edges), executed by various techniques (Fig. 14). In one case, we see distinct groups of imprints (Fig. 15); in the other, separate imprints at approximately equal distances from each other (Fig. 16). Ornamenting

Fig. 12. Vessel-wall decorated with non-comb imprints.

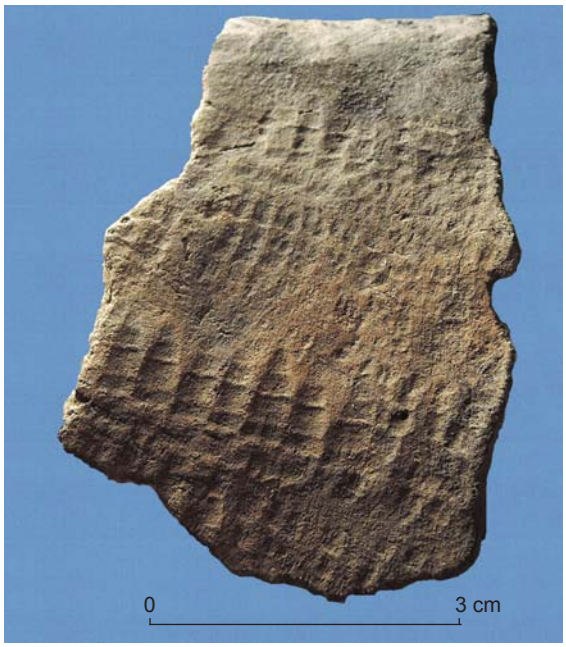

Fig. 13. Vessel-fragment with non-comb imprints on the interior surface.

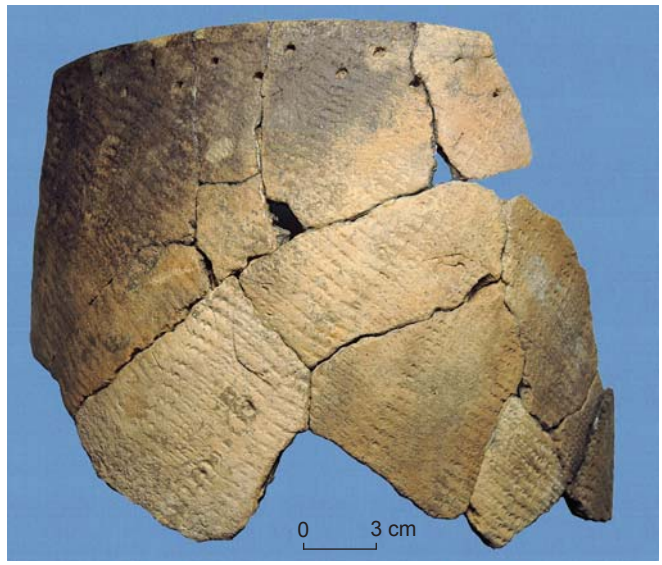

Fig. 14. Vessel-wall which was decorated using two comb tools (see Fig. 15, 16).

Fig. 15. Vessel-fragment with stepping design.

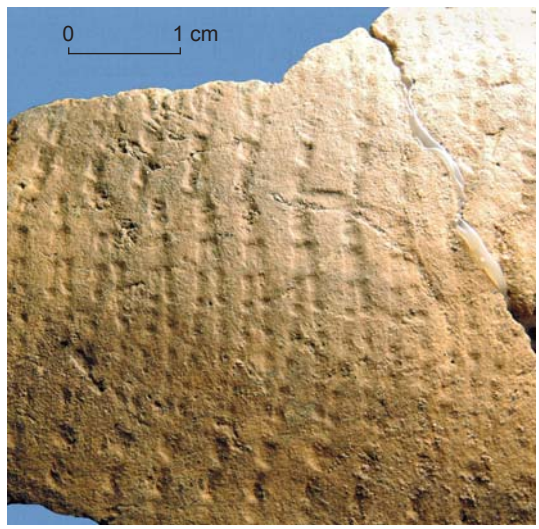

Fig. 16. Vessel-fragment with comb-imprints.

tools of the first type are rare, yet few comparative analogs are known (Stepanova, 2012). We cannot exclude that similar decoration patterns were executed using analogous objects of natural origin.

Discussion

The analysis of the obtained data has identified two traditions (typical and unusual) in the Novoilyinka III pottery, relating to the selection of raw material, paste processing, and decorative techniques. Specific features of this ceramic collection as compared to other Altai pottery assemblages of the Neolithic–early Bronze Age have also been established. The typical Novoilyinka III ornamental tradition included the following:

1) Use of low-ductility ferrous clay intentionally tempered with a considerably large amount of down;

2) Use of patch-technique for manufacturing the vessels;

3) Decoration of the entire vessel-surface;

4) Rows of pits as the essential ornamentation-element;

5) Decoration using mostly non-comb ornamenting tools;

6) Linear decorative compositions; and

7) Decoration of the interior surfaces of rim and walls with the imprints of comb-stamps or cord-design (about 40 % of the total number of vessels).

The unusual features included the use of the ductile clay tempered with mineral matter (grit and grog), decoration of the exterior vessel-surface with comb imprints and, partially, with ornamentation-design. Such features as absence of down in paste and lack of pit-design are most significant.

The majority of vessels in this collection demonstrate certain individual features; few vessels show several individual features or one significant feature. For instance, three vessels show sparse ornamentation (see Fig. 2, *6*); yet down in the paste, plus pit-and-rocking design impressed by a cogged stamp (as well as ornamentation of the interior rim-surface), attribute these vessels to a complex belonging to the same chronological period and the same culture as the rest of the assemblage.

Two vessels are noteworthy. One of them (Fig. 2, *8*) was made of the paste with mineral admixtures representing a blend of various cultural traditions (clay + grog + grit + down + organic matter), and showed decoration made using two comb-tools (or the ornamenting-tool with two working edges) through two different techniques: stepping and rocking. The rows of stamps are slanting. The noted imprints suggest specificity of one of the working edges: cogs were located in sets separated from one another (see Fig. 14, 15). However, this vessel shares some features with the main collection: the presence of down in the paste, and line of pits along the rim's edge. The interior surface of the rim was decorated with rocking-stamp. This motif has been noted on several vessels, although it cannot be considered the leading motif in the collection.

The distinctive features of the other vessel (see Fig. 2, *7*) are decoration with comb-imprints, and the composition of the paste (clay + grit + organic matter). This vessel is the only specimen manufactured from the paste free of down. The features shared with the main ceramic-collection are pits along the rim, and cord-imprints on the interior surface. Common to these two vessels are the presence of grit in the paste, decoration with comb-imprints, and pits located only in the upper parts, unlike other vessels in the collection. The unusual features of these two vessels are the decorative technique (rocking and stepping comb design), the slanting arrangement of rows, and paste composition. The presence of the unusual mineral admixture in the paste (grog containing grit), and the use of down (which is typical of this settlement) suggest a blend of various cultural traditions and contacts of the population, as well as adoption of new traditions of ceramic-manufacture by the incoming population. Pit-design over the rim and the presence of down in the paste allow the assumption that these vessels were made at the site of Novoilyinka III under the influence of the local ceramic tradition.

The pottery decorated with stepping comb-imprints has been reported from the vast territory from the Urals to the Altai Mountains, and is attributed to the chronological period from the Neolithic to the Bronze Age. For instance, a vessel from the disturbed Chalcolithic burial-site of Pavlovka III in the Uglovsky District of the Altai Territory (Southern Kulunda) shows vertical lines of plain rocker imprints (Kiryushin Y.F., Kazakov, 1996: 219, fig. 54, *1*). The Novoilyinka III pottery shows the greatest similarity to the Bolshoy Mys vessels of the Chalcolithic period. The Bolshoy Mys pottery is characterized by decoration with comb-imprints, admixture of granite grit with the high mica content; some Bolshoy Mys vessels bear slanting and vertical lines of combed-rocking imprints (Kiryushin Y.F., 2002: Fig. 3, *1*, *4*; 4; 8, *1*; 15, *3*; Stepanova, 2008).

In general, the Novoilyinka III ceramic collection is unique among other Neolithic and early Bronze Altai assemblages owing to its manufacturing technology and decoration-patterns. Unusual for the steppe and forest-steppe Altai is the use of the low- and medium-ductility clay. The most peculiar Novoilyinka feature is admixture of a considerable amount of down in the paste (Stepanova, 2008, 2010). This cultural tradition has not been recorded elsewhere in Southern Siberia. The use of bird-droppings and down in the ceramic paste has been noted in some Neolithic collections from Eastern Europe (Bobrinsky, 1978: 102–103; Tsetlin, 1991: 93–98; 2012: 254–255). Ornamentation of the ceramicware with non-comb tools and the presence of pit-design as an essential decorative feature represent the main distinctive features of the Novoilyinka III pottery. Ceramics of the Chalcolithic period from Barnaul and Biysk regions in the Ob (Bolshoy Mys culture) and the Altai Mountains (Afanasyevo culture) are decorated mostly with comb-stamp imprints; few vessels also show the non-comb imprints, only as part of composition; decoration with the pit lines has not been noted. Ornamentation of the interior surface of the Novoilyinka III ceramics also represents its unique feature.

The tradition to decorate the entire vessel surfaces with non-comb stamps, recorded at the Novoilyinka III site, is also typical of the Kiprino ceramics from the

Barnaul-Biysk region of the Ob. Close analogs have also been noted in the archaeological materials from the settlements of Vengerovo-3 in Baraba (Molodin, 1977: 33, pl. XXXIII, *1–4*; XXXIV, *3*; XXXV, *2*; XXXVI, *8*; 1985: 17–18, fig. 3, *1–6*, *16*, *19*) and Botai in Northern Kazakhstan (Zaibert, 1993: Fig. 22; Mosin, 2003: Fig. 45–46, 48, 51–56, 65). Similar features in ornamentation-patterns are explained by the fact that these collections, while belonging to various cultures, are derived from a single historical and cultural community of the Neolithic to Bronze Age (Chalcolithic or Early Metal) transitional period. The Novoilyinka III pottery bearing non-comb-stamp imprints and lines of pits is close to the comb-pit and pit-comb ceramics of the forest-zone of the Trans-Urals and Northern Kazakhstan, judging by its compositional patterns and motifs of decoration. Apparently, the Novoilyinka III settlement was located at the eastern periphery of the territory of the historical and cultural community practicing comb-pit, pit-comb, and retreating-pricked-pit decorative designs. This community occupied the vast territory from the forest-zone of Eastern Europe (the Baltic) to the Upper Ob. The distinctness of the Novoilyinka III pottery might be a result of its easternmost peripheral location (Kiryushin K.Y., 2015).

Conclusions

The Novoilyinka III population comprised two main groups practicing two ornamental traditions that correspond to various techniques of vessel-manufacture. Retreating-pricked-pit design represents the main local ornamental tradition for the Novoilyinka III site. It is related to the Kiprino pottery from the Barnaul and Biysk regions of the Ob. The Novoilyinka III ceramics of this type are characterized by an admixture of down into the paste, and the use of the low- and medium-ductility clays.

Currently available data are regrettably not sufficient for reliable association of the Novoilyinka III comb-decoration tradition with the already identified ceramic types or archaeological cultures. The features of the paste's composition suggest a blend of cultural traditions. It can be hypothesized that the tradition of grit-admixture to the paste was formed in the regions that were rich in stone outcrops (Rudny Altai, branches of the Salair Ridge, or the Kazakh Uplands, etc.). This incoming population-group adopted certain techniques of ceramic manufacture and decoration: down-admixture in the paste, pit-decoration pattern, cord-imprints, ornamentation of the rims' interior surfaces, and others. The noted features of two different traditions in mineral admixtures to the paste (grit and grog) suggest that people might have migrated from different places, because a grog admixture in the paste was typical of the regions lacking stone outcrops.

In general, the analysis performed on the Novoilyinka III ceramic manufacture and decorative techniques supports the attribution of the entire pottery assemblage to a single chronological and cultural unit. The described features suggest a mixture of certain cultural traditions that reflects a process of interaction and initial consolidation of the population-groups practicing various traditions, which apparently originated from various landscape zones. This process seems to have been natural for the site that was located on the crossroads between large cultural communities of the forest-steppe Altai, Kazakhstan, and Baraba.

References

Bobrinsky A.A. 1978
Goncharstvo Vostochnoi Evropy. Moscow: Nauka.

Bobrinsky A.A. 1999
Goncharnaya tekhnologiya kak obyekt istoriko-kulturnogo izucheniya. In *Aktualnye problemy izucheniya drevnego goncharstva*. Samara: Izd. Samar. Gos. Ped. Univ.

Kalinina I.V. 1991
Arkhaichnye ornamentiry (tekhnologicheskaya tselesoobraznost i semantika). In *Keramika kak istoricheskiy istochnik (podkhody i metody izucheniya)*. Kuybyshev: Kuybyshev. Gos. Ped. Inst., pp. 34–35.

Kalinina I.V. 1998
Semantika i tekhnologiya drevnikh ornamentov. *Tverskoi arkheologicheskiy sbornik*, iss. 3: 116–123.

Kalinina I.V. 2009
Ocherki po istoricheskoi semantike. St. Petersburg: Izd. St. Peters. Gos. Univ.

Kalinina I.V., Ustinova E.A. 1990
Tekhnologicheskaya klassifikatsiya ornamentov neoliti-chesko-eneoliticheskoi keramiki Uralskogo regiona. *ASGE*, iss. 30: 7–19.

Kazakov A.A., Galchenko A.V., Stepanova N.F. 1994
Ob osobennostyakh ornamentatsii srednevekovoi keramiki. In *Paleodemografiya i migratsionnye protsessy v Zapadnoi Sibiri v drevnosti i srednevekovye*. Barnaul: Izd. Altai. Gos. Univ., pp. 154–155.

Kiryushin K.Y. 2015
Morphology and decoration of ceramics from Novoilyinka III – a Chalcolithic settlement in Northern Kulunda, Southwestern Siberia. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 43 (1): 28–39.

Kiryushin K.Y., Sitnikov S.M. 2009
Problemy khronologii, periodizatsii i kulturnoi prinadlezhnosti poselencheskikh kompleksov neolita Altaiskogo kraya. *Izvestiya Altaiskogo gosudarstvennogo universiteta*, No. 4/4: 101–110.

Kiryushin Y.F. 2002
Eneolit i rannyaya bronza yuga Zapadnoi Sibiri. Barnaul: Izd. Altai. Gos. Univ.

Kiryushin Y.F., Kazakov A.A. 1996
Pamyatniki arkheologii. In *Pamyatniki istorii i kultury yugo-zapadnykh rayonov Altaiskogo kraya*. Barnaul: Izd. Altai. Gos. Univ., pp. 215–223.

Molodin V.I. 1977
Epokha neolita i bronzy lesostepnogo Ob-Irtyshya. Novosibirsk: Nauka.

Molodin V.I. 1985
Baraba v epokhu bronzy. Novosibirsk: Nauka.

Mosin V.S. 2003
Eneoliticheskaya keramika Uralo-Irtyshskogo mezhdurechya. Chelyabinsk: Yuzhn.-Ural. Gos. Univ. (Etnogenez uralskikh narodov).

Stepanova N.F. 2008
Predvaritelnye itogi issledovaniy iskhodnogo syrya i formovochnykh mass keramiki neolita–bronzy Gornogo Altaya i ego predgoriy. In *Izucheniye istoriko-kulturnogo naslediya narodov Yuzhnoi Sibiri*, iss. 7. Gorno-Altaysk: pp. 23–31.

Stepanova N.F. 2010
Osobennosti iskhodnogo syrya i formovochnykh mass keramiki epokhi neolita i bronzy Gornogo Altaya i ego severnykh predgoriy. In *Drevneye goncharstvo: Itogi i perspektivy izucheniya*. Moscow: IA RAN, pp. 117–125.

Stepanova N.F. 2012
Pervye rezultaty izucheniya instrumentov dlya naneseniya ornamenta po ikh otpechatkam na afanasyevskoi keramike (po materialam pogrebalnykh kompleksov iz Gornogo Altaya). In *Igor Gennadyevich Glushkov: Sb. nauch. st*. Khanty-Mansiysk: Pechatnyi mir, pp. 43–50.

Tsetlin Y.B. 1991
Periodizatsiya neolita Verkhnego Povolzhya: Metodicheskiye problemy. Moscow: IA RAN.

Tsetlin Y.B. 2012
Drevnyaya keramika: Teoriya i metody istoriko-kulturnogo podkhoda. Moscow: IA RAN.

Zaibert V.F. 1993
Eneolit Uralo-Irtyshskogo mezhdurechiya. Petropavlovsk: Nauka Resp. Kazakhstan.

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Shatra and *Jurt*: The "Return Address" in the Altaian Ritual*

This article examines the shatra—ritual votive figurines made by Altaian hunters and pastoralists, and their relevance to the history of chess. Based on field studies in an Altaian village, where the author has been conducting research since 2005, and on the museum and archival data collected in St. Petersburg, Moscow, and Gorno-Altaysk, social relations mirrored by the shatra are examined through the lens of Altaian ethnohistory. Proceeding from Edmund Leach's interpretation of ritual, the study reveals the communicative function of the shatra and its relationship to the land and identity claims of the people participating in the ritual. The concept of "return address" is introduced and applied to Altaian ritual. This concept makes it possible to determine the actors in the ritual and the social actions tied with them. The actors' lives are intertwined through strong ties between themselves and the outer world, and are united through the creation of a figurative composition. These ties and their changeability are described using the concept of agency, as an action free of coercion. It is concluded that the shatra may be metaphorically interpreted as a knot of humans, animals, spirits, landscape, things, and materials.

Keywords: *Altaians, game, ritual, ritual objects, communication, agency, religious movement.*

Introduction

In May 2010, I had the opportunity to observe the process of making small figurines out of cheese (*shatra*) and to participate in the ritual. All this happened through the religious movement of *Ak-Jang*, which has been becoming increasingly popular over the last decade in the Karakol and Ursul valleys of the Altai Republic, in the same place where the Burkhanist rituals were commonly practiced in the early 20th century (see (Tadina, Arzyutov, Kisel, 2012)).

It was already about 10 pm. I was at the house of my friends, an Altaian *jarlykchy* (spiritual leaders in the *Ak-Jang* movement) and his wife; we were waiting for a guest who was supposed to carve figurines of cheese (*shatra*) for placing them on each of ten stone altars (*tagyls*) in the early morning on the next day during the *mÿrgÿÿl* collective prayers*. The *byshtak*-cheese was brought earlier that day by another participant of the ritual who had made it early in the morning**. *Jalama-*

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*These prayers are conducted twice a year, in the spring (it is called *jazhyl bÿÿr*) and in the autumn (*sary bÿÿr*).

***Byshtak* is a pressed soft cheese of fast preparation made of boiled cow's milk (Anokhin, 2013: 98; Potapov, 1953; Muytuyeva, 2007: 81). It should be mentioned that some of the locals expressed disapproval about cases when the *shatra* for *jazhyl bÿÿr* were made of store-bought cheese due to the weakness of cows who had not yet recovered after the winter and were giving very little milk.

Fig. 1. Shatra. 2010. Photograph by the author.

bands (they are also called *kyira*) in four colors (white, blue, yellow, and green) were also prepared. Finally, our guest, who was about 30 years old, arrived. As my friend said, the carver had to be a young married man. The trays which were especially prepared for the ritual, were already on the table; the cheese was lying on a wooden board, and a knife was placed next to the cheese. All these were covered by a white cloth. The fellow came in quietly, sat down at the table and, exchanging a few words with the hostess, removed the white cloth and began to carve…

The house was quite, and the only motion came from the hostess carrying the trays with the ready small figurines made of cheese and arranging them on the bed in the same room. All the people gazed at the maker looking closely at his every move. Stealthily, I was able to ask questions of the hostess who was one of the main experts on everything that was happening. She explained in a whisper that the fellow was carving small figurines of domestic animals, *aiyl* (a model of Altai dwelling), and of a man and a woman, and this entire composition as a whole symbolized a *jurt* (the household, comprising the family, the livestock, and the buildings). The fellow finished his carvings by about midnight, at which point, frankly speaking, everybody could barely keep their eyes open. Ten trays with the *shatra** were on the table (Fig. 1). Each tray had *chaky* ("a hitching post"), *ottyn bazhy chaky* ("a hitching post at the head of the hearth"), *ui* ("a cow"), *at* ("a horse"), *koi* ("sheep"), *tuular* ("mountains"), the symbols of the six corners of an *aiyl*, *ochok* ("a hearth"), *er-kizhi* ("a male"), *ÿi-kizhi* ("a female"), *jangyrtyk* ("a platform for things"), *ayak* / *salkysh* ("dishware"), *bozogy* ("a threshold"), and *törding kaiyrchagy* ("a chest where ritual objects are stored"). The remaining cheese was placed into a wooden bowl which, just as the trays, would be taken to the *tagyl* the next morning. Everyone began to slowly leave the house to meet the next day at dawn at the foot of a local hill (*bolchok*) and go to the *mÿrgÿÿl*.

The *shatra* figurines are interesting for several reasons. In the mountainous taiga, where the northern Altaians live, the hunters would place this kind of figurine near streams or on special platforms, expecting that they would materialize as real animal, the object of hunt. It is easy to correlate *shatra* with the history of *shatrang* / *shatrandzh* (chess) in the Mongolian steppes. In the coinciding names of *shatra* as a game and the ritual figurines, some scholars (Tyukhteneva, 2009: 89, note 1) see only homonymy (for the criticism of B. Malinovsky's "doctrine of homonyms" in the Siberian anthropology, see (Broz, Willerslev, 2012)). The interplay of these traditions became reflected in the rituals of both Burkhanism (according to the data from the first third of the 20th century) and of the contemporary movement of *Ak-Jang*, where *shatra* is related to the idea of *jurt*.

This article analyzes the history and the place of the *shatra* in the contemporary rituals (we will use the spring ritual of *jazhyl bÿÿr* as a basis*). In order to analyze the figurines made of cheese** in the contemporary rituals of the Altaians, we should introduce the concept of "return address". The participants of the ritual define the "direct addressee" or the one to whom the ritual actions are directed as *eezi* ("the master", referring to the master-spirit of the place), or simply the Altai. S.P. Tyukhteneva wrote about it in more precise terms, "The addressees of the good wishes are, according to the texts, the Altai, the sun, the moon, the deity of Ÿch Kurbustan, Kayrakan (sky god), mountain tops sacred to the people of the area, and the trees" (2009: 88). In contrast, the "return address" is a manifestation of subjectivity in the ritual, a way to define oneself, which is precisely manifested by the figurines

*I brought exactly the same figurines which the carver had made to the Museum of Anthropology and Ethnography of RAS (Collection No. 7589).

**Jazhyl bÿÿr* ("green leaves") and *sary bÿÿr* ("yellow leaves") are two major rituals in the *Ak-Jang* movement in the Altai Mountains, which are performed in the spring and in the autumn, respectively. Their purpose is asking for a good production year (in the spring) and thanksgiving for this (in the autumn).

**For the analysis of such figurines, archaeologists usually use the concept of votive objects—small copies of objects that are intended for performing a ritual (see, e.g., (Osborne, 2004)).

of cheese, their composition, and a specific order at the site of the ritual. Anthropologists designate such forms of definition using the concept of agency. Depending on the name (*kochkorlor*, *shatra*) and purpose of the figurines (for placing in the taiga, at a ritual site, for a game), such an "address" can be determined from three points of view:

1. Perspective from the taiga. In this case, the figurines constitute a symbolic representation of a wild animal which has to be killed. The taiga acts as the place of their creation and ritual use.

2. Perspective from a village. In this case, we may speak about a certain cattle breeding perspective, using small figurines of domestic animals, models of household material components, as well as images that represent the "domesticated" space (figurines representing the sacred mountains which are closest to the village and the river valley). Both settlements and ritual sites located in the ancestral territories act as the place of the figurines' creation and ritual use.

3. Perspective from a gaming table. The figurines are used for playing the *shatra* game.

In defining these perspectives, I do not intend to place them in chronological order. This is more a means to endow the figurines with meaning in different locations, where one and the same person can be. Moreover, it should be mentioned that the economy of the Altai people manifests the hunting and the cattle breeding continuum or, according to A. Ventsel's analysis of the Yakut materials, hunting and cattle breeding can be regarded as "complementary strategies" (2006).

Thus, the main purpose of this article is the analysis of all three variants of the *shatra* and *kochkorlor* in terms of connection between the figurines and the surrounding landscape, and in terms of expressing the subjectivity in the ritual.

Perspective from the taiga

The earliest information about small animal figurines made of clay or other materials is derived from the culture of the northern Altaians (*jish kizhi*)—the residents of the mountainous taiga who would make figurines before the hunt. A collection of such figurines is kept in the Russian Museum of Ethnography (Collection No. 597, items No. 12–16, published in (Ivanov, 1979: 77); Na grani mirov…, 2006: 265). S.V. Ivanov wrote about creating and using similar representations of animals on the basis of the words of the Altaian artist G.I. Choros-Gurkin (recorded in 1935), "The Altaians* called them *kochkorlor* ("mountain sheep", argali, *Ovis ammon* – **D.A.**). In total, there should be 27 pieces. Such figurines were sculpted of oatmeal flour, the soft part of bread, clay, or farmer's cheese. Then people would build a platform at a distance from their dwellings, cover it with a piece of birch bark, and set the sculpted animals on the birch bark. The sacrifice was offered to the white spirit *Ayzan* (the spirit with such a name is unknown – **D.A.**), the spirits of the earth, sometimes to a shaman-ancestor. The necks and the horns of the sheep were wrapped with yellow thread or cord" (1979: 77). A description of the same figurines was made by L.P. Potapov (1929: 131) and D.K. Zelenin (1929: 46). Potapov thus wrote, "(The Altaians) sculpt small figurines of goats and red deer out of barley flour and place them around the taiga in the belief that the Altai would turn them into living animals" (2001: 135). Here we may see the magical function of these animal sculptures, apparently quite comparable with the purpose of small statuary known from archaeological materials (see (Molodin, Oktyabrskaya, Chemyakina, 2000: 33)). As far as Southern Siberia is concerned, Ivanov pointed to the spread of similar figurines among Beltyrs, Shors, Kumandins, Teleuts, Altai Kizhi people, and Telengits (1979: 156–157). Parallels can also be found among the Ob Ugrians who would use the representations of birds (grouses), deer, elk, and horses made of oatmeal flour in the bear festival. Ivanov noted that "all this statuary is of relatively recent origin; it replaced birds, deer, or elk which in the past were killed at the festival and whose meat was then eaten. This is indicated by the breaking of the dough figurines" (1970: 50). *Kozulki* / *kozuli* among the Pomors, small figurines made for Christmas and representing deer, horses, cows, and others, can be regarded as another parallel to the *kochkorlor.* Such figurines were made of flour and were then given to children after they sang Christmas carols. The figurines remaining at home were kept and used as Easter food; they were also given to the cattle to eat in the case of illness (see (Zelenin 1991: 401; Propp, 1995: 38–39)).

Unfortunately, I do not know what exactly the Northern Altai hunters would do with the figurines (eat them, break them, etc.). Figurines for hunting and cattle breeding purposes differ in terms of their material: the former are made of grains (bread, oatmeal flour), while the latter are made of dairy products (cheese).

Grains and vegetable foods are very diverse among the Altaians, particularly in the north of the region (see (Potapov, 1953; Muytuyeva, 2007: 100–146)), but their status was also high in the Central/Eastern, predominantly cattle breeding Altai (Ongudaysky and Ust-Kansky districts), as evidenced by a very beautiful Altaian greeting, "What are the news mixed with the scent of onions?" ("*Solung-sobur, sogono, jyttu ne bar?*"). The connection between hunting and vegetable food can be seen in the traditional implements, "Skins of animals, especially wild animals, had great value in storing flour products. Such skins were waterproof (*chyk tartpas*).

*Choros-Gurkin probably meant the northern Altaians or possibly Teleuts, whose culture he knew best.

The Altai Kizhi people made suede out of animal skins and produced bags of various sizes (*bashtyk*) for keeping *kocho*, or ready *talkan*. They would sew leather bags "*tektiy*" out of argali skins. In addition, the bags "*tulup*" made of bovine cattle and horse skins were used for household needs for storing barley and other foods" (Muytuyeva, 2007: 127).

Hunting figurines focus on wild animals (*ang*). Their placement primarily defines the taiga*, and the set of figurines from the known descriptions and field materials of the author contains no other representations besides those of wild animals.

Perspective from a village

Comparing the figurines made of grains (hunting figurines) and of cheese, Ivanov pointed out that apparently they should be distinguished, and the latter could act as "decoration" and "scenes from the Altaian life" (1979: 76). The opposition of vegetable and dairy products can be found in the Altai language and rituals. Thus, dairy products (*ak ash*, "white (sacred) food") is closely related to the Burkhanist rituals, and the religious movement itself in one of its versions was called *sÿt jang*, the "milk faith". In the Altaian tradition, the cow belongs to the *sook tumchyktu mal* class of animals ("animals with cold breath") and is associated with the Lower World. Precisely cow's milk is needed for producing the cheese used for making the *shatra*. In keeping with the structuralist model of interpretation, V.A. Muytuyeva pointed out that the cheese-manufacturing procedure by itself would change the status of the product by "purifying it" (2007: 65). The animals that are represented in the *shatra* composition are divided into two groups: those with cold breath and those with hot breath. Thus, cow figurines are placed on one side of the representation of the hitching post, while sheep and horse figurines are placed on the other side (Fig. 1, left side of the tray; for more details see (Broz, 2007)).

At present, the composition of the cattle breeding figurines entails the representation not only of domestic animals, but also of dwellings and people. Usually, the researchers of Burkhanism pointed out that this composition testified to the transition to a bloodless sacrifice. Tyukhteneva mentioned the *shatra* and its parallel *balyng* / *balgyn*** associated with celebrating the New Year, *Chaga Bairam*, primarily in the south of the Altai (2009: 89). According to her information, the ritual figurines were burned on the *tagyl*. The Altai people living in the valleys of the Karakol and Ursul rivers do not burn the figurines, but simply leave them on the *tagyl* (see below for more details).

The materials collected by A.G. Danilin show the structure of the *shatra*: figurines of horses, sheep, and "pyramids"*. Danilin distinguished between two types of "pyramids": simple (*şatra*) and stepped (*sak***). He also pointed to the use of "bones from the legs of sheep" in the composition (1932: 73). The disappearance of the "pyramids" today might have been caused by what is probably the main idea of *Ak-Jang*, the struggle with Buddhism (Tadina, Arzyutov, Kisel, 2012: 409; Halemba, 2003). According to the field materials of Danilin, there was always an even number of figurines: 2, 4, 20, 24, 40, 42, or 100 objects (Archive of the Museum of Anthropology and Ethnography of RAS (AMAE RAS), F. 15, Inv. 1, item 11, fol. 4v, 5v; see also the Archive of RAS, St. Petersburg Branch, F. 135, Inv. 2, item 102, fol. 40). Danilin observed insignificant variability in the figurines within the Ust-Kansky, Shebalinsky, and Ongudaysky districts (AMAE RAS, F. 15, Inv. 1, item 11, fol. 5v). The materials of Danilin contain a drawing, probably made according to the information provided by his informant K.I. Tanashev (about him, see (Tokarev, 1947: 144; Dyakonova, 1998; Kozintsev, 2010)), where the meaning of the top and each step of the "pyramid" is indicated (Fig. 2). It is noteworthy that both places of hunting (C) and grazing (D) have been indicated in the drawing, which may be evidence of a certain blending of hunting *kochkorlor* and cattle breeding *shatra*.

A.G. Danilin and L.E. Karunovskaya, who collected materials on Burkhanism, brought *shatra* to the MAE from their expedition of 1927, although not the entire "set", but only a "pyramid" made of *syrchik* (meaning the Altaian *kurut* cheese) and a small figurine of *at*, the horse. Unfortunately, both of these objects (MAE 3650-81 and MAE 3650-82) were lost by 1951 (according to the inventory of MAE 3650; see the only surviving illustration in (Ivanov, 1979: 76)). Danilin and Karunovskaya, who worked with Tanashev for a long time, recorded from him (?) a special "prayer" of the Altaians which they recited while referring to the *shatra* (AMAE RAS, F. 15, Inv. 1, item 50, fol. 36). The prayer uses the epithet "*jort jelu kök shatra*" (lit. "four-sided blue *shatra*"). The definition "*kök*" is noteworthy. I cited

*The word "*taiga*" also has a meaning of "a mountain covered with forest" which is associated with the hunting places (Oirotsko-russkiy slovar, 1947: 139).

**Apparently, this word is known only in the south of the Altai. The word *balin* can be found in the Mongolian language in the sense of "small sacrificial flour figurines, sacrificial bakery, offering, sacrifice" (Bolshoi akademicheskiy mongolsko-russkiy slovar, 2001: 221).

*In Tibetan Buddhism, such "pyramids" are the models of *suburgan*. These figurines can be seen in documentary footage filmed in the Altai in the late 1920s (?) (Russian State Film and Photo Archive, No. 2724).

**The main meaning of *chaky* is the "hitching post".

the original translation of Tanashev—"blue", while the semantic field of *kök* includes blue, light-blue, gray, or green (especially when applied to young leaves), which gave N.A. Baskakov reason to speak about the "Turkic color-blindness" (see (Mayzina, 2006)). In the "prayer", people appeal to the Altai who is asked to give children and cattle.

Despite the gradual forgetting of the meaning of the *shatra* elements, the ritual of arranging the figurines continued to exist. A person whom I personally knew (now he is 50 years old) said that when he was a child at the age of 10–12 years (that is, those events happened approximately in the early 1970s), he became sick and his father carved *shatra* (he does not remember what they looked like), and brought them to *arzhan-suu* ("the spring") not far from the village of Karakol in Ongudaysky District. Exactly the same purpose of *shatra* in the village of Kulady in the Karakol valley was described by E.A. Okladnikova, "These figurines <…> were regarded as a kind of offering to the spirits of the mountains and to the master of wild animals of the area" (1983: 173)*, and a little later, Okladnikova specified that the figurines acted as substitutes of real animals which were supposed to return to people. In our personal correspondence, Okladnikova mentioned the absence of human figurines in the composition of the *shatra*. Otherwise the composition which she saw was similar to the present-day composition, which was described in the beginning of this article. However, probably the most important piece of information was that at the end of the ritual the figurines were burned (the message was received by e-mail on October 14, 2012).

Fig. 2. Sketch of the *shatra*. AMAE RAS, F. 15, Inv. 1, item 61, fol. 76v.

L.V. Chanchibayeva gave information on visitations to *arzhan-suu* in the Ongudaysky District. She said that the *shatra* were carved both of *byshtak* and *kurut*, and were placed on an altar made of stones. "These small figurines represented actual animals which were offered as a gift to the master-spirit of *arzhan*" (Chanchibayeva, 1978: 95–96). It is important that in this case the taiga and the cattle breeding styles of the figurines still remained undivided.

A.I. Nayeva provided a description of a visit to *arzhan-suu* (curative springs) in the early 2000s. She mentioned that *shatra* in the form of people, household utensils, a yurt, and animals were an indispensable attribute of the ritual (Nayeva, 2002). We may observe here a further change in the idea of *shatra* and introduction of human figurines into their structure.

In 2012, before the beginning of Kurultai of *söóka tölös* in the place named Temuchin near the village of Yelo, people performed the ritual in which the *shatra* were placed on a flat stone near a birch tree with *jalama* / *kyira* tied to it. The *shatra* included the figurines of horses (*at*), mountain sheep (*kochkor*), a representation of a hitching post (*chaky*), and "pyramids". In general, such a model is directly related to the Burkhanist model. We can say that various traditions of carving the figurines are followed in different situations.

In order to better understand the role which *shatra* played in Burkhanism in the early 20th century and plays in the contemporary ritual practices of the Altaians, we should turn to the use of *shatra* as a game.

Perspective from a gaming table

The Altaian epos Kozyn-Erkesh (Ulagashev, 1941: 219) mentions the game of *shatra*. This game was vaguely reminiscent of checkers (Slovar…, 1884: 445; Oirotsko-russkiy slovar, 1947: 185) and continued to be played even in the 1950s in the south of the present-day Altai Republic, in the Ulagansky and Kosh-Agachsky districts (Pakhayev, 1960). In the south, where the influence of the Mongolian culture was most pronounced, the parallels with *shatra* are associated with the vast history of chess (Murray, 1913; Orbeli, Trever, 1936; Kocheshkov, 1972; Eales, 1985). Chess originated in India; then the game penetrated through Tibet to Mongolia and further north to southern Siberia (Montell, 1939: 83; Vainshtein, 1974: 180). The lexical meaning confirms this in many ways. Thus, the Sanskrit *caturanga* ("four rows" / "four formations" (Montell, 1939: 82))

*There was a mistake in the title of that article. It should be read not "Kumandin Altai Kizhi" but "Kuladin" (from the name of the village) or "Karakol" (from the name of the river) people.

relates to the ancient Turkic *shatrandzh* / *šatranž* (Drevnetyurkskiy slovar, 1969: 521). Mongolian chess is called *shatyr* / *chatyr* / *shatar* (Savenkov, 1905; AMAE RAS, F. K-I, Inv. 1, item 62); the figurines could be made of stone, metal, or bone (Kocheshkov, 1972: 134). The name of the Tuvan chess sounds similar to the Mongolian—*shydyraa* (Murray, 1913: 311; Karalkin, 1971; Vainshtein, 1974: 178–180; Sat Bril, 1987), and its history, just like the Altaian *shatra*, is associated with the spread of Tibetan Buddhism in the region since the 16th–17th centuries. The main players in *shydyraa* were lamas (Savenkov, 1905; Karalkin, 1971: 137–138; Montell, 1939; Kabzinska-Stawarz, 1991: 28).

The history of *shatra* in the movement from south to north has left its mark on the external appearance of the figurines, which combine the discernable "Mongolian traits" with the local tradition of carving similar figurines. Such a synthesis sometimes opens up interesting possibilities for interpretation. Thus, I.U. Sambu drew attention to the fact that "Tuvan games '*buga shydyraa*' and '*tugul shydyraa*' resemble hunting" (1974: 21). Association with hunting can be important for two reasons: firstly, the game entails not simply a model of society, but a certain model of battle (this is suggested even by the Sanskrit etymology); secondly, it shows that the set of animal figurines changed from culture to culture, and was related to differences in the economic practices (see (Kocheshkov, 1972)). Already in the game, the military strategy has been replaced by the spatial metaphor. In this regard, I should cite the opinion of the medievalist S.I. Luchitskaya, who analyzed a treatise on the game of chess from the 13th century, "Chess is primarily a spatial metaphor of society (as, indeed, its bodily metaphor), and spatial symbolism which plays an important role in placing the pieces on the chess board, here coincides with social symbolism" (2007: 134).

External appearance of the figurines was not invariable and depended on local carving traditions. As opposed to the Tuvan figurines (Kisel, 2004), the Altaian figurines almost completely lost their original appearance. According to informant, K.N. Shumarov, today, three types of figurines are used: *baatyr*, *biy*, and *shatra* (in their status equal to pawns; in the Kosh-Agachsky District they are also called *juuchyldar*, "warriors"). All of them can be replaced with checkers with the identifying marks glued to them.

In the Altai, *shatra* as a game was revived only in 1970–1980. The employees of the Gorno-Altaysk Research Institute of History, Language and Literature took part in reconstructing the game. V.L. Taushkanov and B.T. Samykov played a great role in codification of the rules. However, the reforming of the rules has not received universal recognition, and today there are a number of *shatra* variants. Gradually, the game started to spread far beyond the southern regions of Altai, has received Altai Republic status, and since 1988 has been included into the list of competitions at the ethnic Altaian festival El Oiyn (lit. "folk game"). The local newspaper *Altaydyng Cholmony* often publishes the rules of the *shatra* game, the results of the tournaments, and reviews of gaming strategies (see, e.g., (Yadagayev, 2004)). In the village of Onguday, I have witnessed enormous enthusiasm of the local residents who actively participated in chess and *shatra* tournaments.

Just as figurines made of oat flour/dough/cheese, chess can be found in Northern Asia as the game of Dolgans, Yakuts, Evenki, Nenets, Nganasans, Yukaghirs, Kamchadals, and Chukchi. At the very beginning of the 17th century, chess was known to Russian Arctic sailors, from whom the game might have possibly found its way to the peoples of the North (see (Zamyatin, 1951)).

"Return address"

Anthropologists have noted the communicative nature of the ritual arranging the *shatra* on the *tagyl*. At the beginning of this article, I cited the information of Tyukhteneva on the variety of addressees for good wishes (2009: 88). It is important that each of them is connected with the entire environment and not with its individual components. For describing the surrounding landscape together with all living beings, the Altai language uses the notion of *ar-bÿtken* (cf. English "environment"). However, if we look on the other hand and try to see the people performing the ritual in this communication, we will see a slightly different picture. The suggested descriptions can be compared with the concept of the return address on a mail envelope, where the addressee locates himself in the culturally modified space of cities/villages, streets, and buildings. However, when one needs to send a letter to a place where the usual order of space is distorted, referencing to the place becomes less obvious and the addressee begins to be associated with some other points on the map.

The Altaian family clans are directly connected with the Altai Mountains, and this link defines the relationship between humans and the landscape (Tyukhteneva, 1995). The cheese figurines are connected to the "master" of the area (*eezi*) through their arrangement on the ritual place (*tagyl*), represented by several layers of stones which symbolize the ancestral mountains. During the ritual, the participants choose their own stone altar on the basis of their own affiliation with the family clan. The composition of the figurines is not a sacrifice by itself, but an indication of the point on the map where the grace expressed in the wishes which were articulated or comprehended during the ritual, should descend. The composition of the figurines was defined by my

Fig. 3. A *tagyl* with *shatra*. 2010. Photograph by the author.

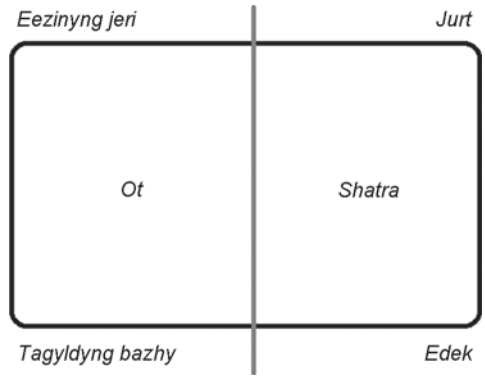

Fig. 4. Meaning of places on the *tagyl*. *Eezinyng jeri* – the land of the master-spirit, *ot* – fire, *tagyldyng bazhy* – the summit of the ritual space; *jurt* – household, *shatra* – small figurines made of cheese, *edek* – the foot (lit. "hemline").

field partners as the *jurt*, that is, as a household, but at the same time they repeatedly emphasized that *jurt* has another meaning of "village"*, and for referring to the village the Altai language also uses the word *teremne*— a borrowing from the Russian (the modified Russian word "*derevnya*", "village"), and in the case of the *shatra*, it is exactly the village where the *tagyl* is installed.

This ritual manifests the combination of the "ancestral" and "territorial" logic. The latter logic is so pliable that it even absorbed the Soviet policies aimed at creation and then consolidation of villages. Thus, stone *tagyls* symbolizing ancestral mountains and cheese figurines designating both the household and village, build up the perspective where both "mapping systems" work. The photograph (Fig. 3) and the diagram (Fig. 4) show how this intertwining is implemented. The multidimensional composition is recreated with the summit of the *tagyl* (in a symbolic sense) in its western part, where the fire is made, and with the foot of the *tagyl* in its eastern part with the figurines of cheese as a symbol of the *jurt*. The cubic shape of the *tagyl* is transformed into a pyramid with the top and the foot, and it is also linked with the cardinal directions and the space of the village. The interplay with the *shatra* game is of interest in that respect, where the board as well as the surface of the *tagyl* is divided into two parts. If in the game these parts belong to the opponents (the model of the battle), in the ritual they belong to the acting participants. The *shatra* arranged on the *tagyl* become the recipients of future grace and at the same time designate the participants in the ritual, while the place for the fire symbolizes the donor and the source of that grace. The link between the mountains, the master-spirit, the settlement, the family clan, and the specific person who is giving the offering is visualized here. If we go back to the issue of family ties, the very expansion of the context of the *shatra*, its understanding as the household – the village – the territory, makes it possible to see that space is just a way of visualizing relationship; it creates a visible link between the surrounding space and kinship. This is why anthropologists also discern the logic of kinship in the chess game (Wagner, 2011).

The choice of where and why to put individual figurines, is not a mechanical one. The participants in the rituals (in both the cattle breeding and the hunting types) choose a certain composition based on their relationship with the landscape and the animals, as well as their own social experience. Each time, preparing for hunting, or calving/lambing of the livestock, the person creates a model of space where these social, economic, and environmental relationships would be most relevant (the taiga or settlement). The game which came from the "south" has become an important factor in organizing the composition of the figurines, in giving it structural nature and explicit social references. The figurines in the ritual both in the taiga and during *mÿrgÿÿl* are a reflection of relationships between the local community and the landscape, defining the purpose of the prayer and showing the "return address" of the message, turning the ritual into a message to oneself, as it was noted by E. Leach (1976).

If we return to the Burkhanist figurines, they still manifest undivided hunting and cattle breeding trends in the structuring of the symbolism. Gradually, the hunters' *kochkorlor* have started to represent exclusively wild animals as opposed to the cattle breeding *shatra* representing domestic animals. This opposition took shape in the dialogue between the "village" and the

*Note that in spite of its multiple meanings, the word *jurt* is not used by the Altaians living in the Karakol and Ursul valleys for designating the yurt as a dwelling.

"taiga". It may be observed that "village–taiga" as a pendulum of economic activity of the Altaians in the western (central) part of the Republic, affects the rituals with the *shatra* and makes it possible to speak about the changing relationship between man and the landscape, a change in the methods of localization in the landscape. The figurines symbolizing cattle/wild animals are the stable part of the *shatra* both in the village and in the taiga.

The studies on hunting groups in Siberia indicate that it is as if the hunter disappears into the taiga and starts to imitate the animal world (Willerslev, 2004). In this space, his denotation might destroy fine binding threads between man and animal. Therefore, the magical action of arranging the figurines made of oatmeal flour or clay defines not a person as a hunter, but wild animals that the hunter would like to kill. This logic has more to do not with a specific place or group (for example, the northern Altaians), but with the relationship with the landscape. In this situation, it is as if the hunter clarifies the uncertainty, trying to predict the hunting luck (cf. (Broz, Willerslev, 2012)).

If we compare the hunting and the cattle breeding *shatra*, we can see an additional dimension. If in the forest the hunter deliberately "erases" time, going beyond sociality, the representations and arrangement of the figurines for *mÿrgÿÿl* refer to timelessness: all human and animal figurines are located within/near the *ayil* which in the daily life for quite a long time has not been used as a dwelling but as a summer kitchen (cf. (Arzyutov, 2013: 123–124)). Through the interpretation of the *ayil* one may see the practices related to "museumification" of nature and to the ritual management not only of space, but also of time. Such a turn to timelessness speaks for the emphasis on the figurines and their relationships with space.

The game of *shatra* which came from Tibet, has undergone a change from the logic of battle to the spatial metaphor of ritual figurines in the Altai. In the chess game itself, in spite of the desire for spatial ordering of social roles through the figurines, the context is being lost, becoming limited by the chess board. On the contrary, in the case of ritual figurines, the models aspire to such diverse and multidimensional contexts that they seem to appropriate the surrounding area both in the social, mythological, and geographical sense.

Conclusions

The analysis of the *shatra* gives reason to consider them as a certain node in a network of diverse relationships between humans, animals, landscapes, things, and spirits. The certain freedom with which an Altaian person creates a composition symbolizing the *jurt*, and after a while, when going on a hunt, he creates the *kochkorlor*, a different composition using the figurines of wild animals, suggests that the choice of strategies is associated with the need to define oneself in the landscape as a sculptural composition which can be seen from above. This upper point may be located on the western side of the *tagyl*, the opening space for the syntagmatic chain, including both kinship (ancestral mountains) and spatial localization (the *tagyl* of a certain village), but it may also be located on the top of a mountain in the taiga, where the arranged figurines rather resemble the model of the herd. The very existence of votive figurines, arranged in a certain order, automatically suggests the thought about the presence of a deity-like observer. Since the addressee of good wishes is not very specific as Tyukhteneva aptly observed (2009: 88), there is mobility in respect to the *shatra*, the addressee, and the "return address". It is exactly here that we may see agency where freedom of choice and action make it possible to build up multiple models of relationships, sometimes stable and sometimes fragile, just as the figurines of cheese. In the diagram which shows the meaning of different parts of the *tagyl* (Fig. 4), the pair of "east–west" in the stonework determines the axis of the two "addresses".

Along with the *shatra*, Altaians have other kinds of small gaming and votive figurines which are related to human activities and the landscape where these activities are carried out. This multiplicity in the use of figurines gives an idea of the dynamics of the social life among Altaians for over the past hundred years.

References

Anokhin A.V. 2013
Materialnoye proizvodstvo oirotov i shortsev. St. Petersburg.: Most.

Arzyutov D.V. 2013
Altaiskiy ritualnyi kover i sozdaniye geterotopii. *Antropologicheskiy forum Online*, No. 18: 85–133.

Bolshoi akademicheskiy mongolsko-russkiy slovar. 2001
Vol. 1. Moscow: Academia.

Broz L. 2007
Pastoral perspectivism: A view from Altai. *Inner Asia*, No. 9: 291–310.

Broz L., Willerslev R. 2012
When good luck is bad fortune: Between too little and too much hunting success in Siberia. *Social Analysis*, vol. 56 (2): 73–89.

Chanchibayeva L.V. 1978
O sovremennykh religioznykh perezhitkakh u altaitsev. In *Etnografiya narodov Altaya i Zapadnoi Sibiri*. Novosibirsk: Nauka, pp. 90–103.

Danilin A.G. 1932
Burkhanizm na Altae i ego kontr-revolyutsionnaya rol. *Sovetskaya etnografiya*, No. 1: 63–91.

Drevnetyurkskiy slovar. 1969
Leningrad: Nauka.

Dyakonova V.P. 1998
K. Tanashev: Altaiskiy yarlykchi ili kam? In *Lavrovskiye (sredneaziatsko-kavkazskiye) chteniya 1996–1997 gg*. St. Petersburg: MAE RAN, pp. 132–134.

Eales R. 1985
Chess – The History of a Game. New York: Facts on File Press.

Halemba A. 2003
Contemporary religious life in the Republic of Altai: The interaction of Buddhism and shamanism. *Sibirica*, vol. 3 (2): 165–182.

Ivanov S.V. 1970
Skulptura narodov Severa Sibiri XIX – pervoi poloviny XX v. Leningrad: Nauka.

Ivanov S.V. 1979
Skulptura altaitsev, khakasov i sibirskikh tatar. XVIII – pervaya chetvert XX v. Leningrad: Nauka.

Kabzinska-Stawarz I. 1991
Games of Mongolian Shepherds. Warsaw: Institute of the History of Material Culture, Polish Academy of Sciences.

Karalkin P.I. 1971
Tuvinskiye shakhmaty. Etnografiya narodov SSSR. Leningrad: Geogr. obshchestvo SSSR, pp. 136–145.

Kisel V.A. 2004
Istoriya kamnereznogo iskusstva Tuvy. *Sbornik MAE*, vol. 49: 44–56.

Kocheshkov N.V. 1972
Shakhmaty u mongoloyazychnykh narodov XIX–XX vv. *Sovetskaya etnografiya*, No. 1: 132–138.

Kozintsev A.G. 2010
Istoriya odnogo shamanskogo bubna. *Nauka iz pervykh ruk*, No. 3: 76–87.

Leach E. 1976
Culture and Communication: The Logic by Which Symbols are Connected. Cambridge: Cambridge Univ. Press.

Luchitskaya S.I. 2007
Shakhmaty kak metafora srednevekovogo obshchestva. *Odissei: Chelovek v istorii*, No. 1: 127–147.

Mayzina A.N. 2006
Nazvaniya tsveta v altaiskom yazyke (v sopostavlenii s mongolskim yazykom). In *Altai–Rossiya: Cherez veka v budushchee: Materialy Vseros. nauch.-prakt. konf., posvyash. 250-letiyu vkhozhdeniya altaiskogo naroda v sostav Rossiyskogo gosudarstva*, vol. 2. Gorno-Altaysk: pp. 249–252.

Molodin V.I., Oktyabrskaya I.V., Chemyakina M.A. 2000
Obraz medvedya v plastike zapadnosibirskikh aborigenov epokhi neolita i bronzy. In *Narody Sibiri: Istoriya i kultura: Medved v drevnikh i sovremennykh kulturakh Sibiri*. Novosibirsk: Izd. IAE SO RAN, pp. 23–36.

Montell G. 1939
Mongolian chess and chess-men. *Ethnos: Journal of Anthropology*, vol. 4 (2): 81–104.

Murray H.J.R. 1913
A History of Chess. Oxford: Oxford Univ. Press.

Muytuyeva V.A. 2007
Traditsionnaya pishcha altai-kizhi: Obryady i predstavleniya. Tomsk: Izd. Tom. Gos. Univ.

Nayeva A.I. 2002
Obryady, posvyashchennye tselebnym istochnikam arzhan-suu. *V mire nauki, kultury, obrazovaniya*, No. 10/11. URL: http://e-lib.gasu.ru/MNKO/archive/2002/12/aspir/10.html. Accessed July 25, 2016.

Na grani mirov: Shamanizm narodov Sibiri. 2006
(Iz sobraniya Rossiyskogo etnograficheskogo muzeya: albom). Moscow: Khudozhnik i kniga.

Oirotsko-russkiy slovar. 1947
N.A. Baskakov, T.M. Toshchakova (eds.). Moscow: OGIZ.

Okladnikova E.A. 1983
Ritualnye skulpturki zhivotnykh iz syra kumandinskikh altai-kizhi. In *Plastika i risunki drevnikh kultur*. Novosibirsk: Nauka, pp. 161–175.

Orbeli I., Trever K. 1936
Shatrang: Kniga o shakhmatakh. Leningrad: Izd. Gos. Ermitazha.

Osborne R. 2004
Hoards, votives, offerings: The archaeology of the dedicated object. *World Archaeology*, vol. 36 (1): 1–10.

Pakhayev S.Y. 1960
Shatra. *Uchenye zapiski GANIIIYAL*, iss. 3: 147–156.

Potapov L.P. 1929
Okhotnichyi poverya i obryady u altaiskikh turkov. In *Kultura i pismennost Vostoka*, bk. V. Baku: Vsesoyuz. tsentr. komitet novogo tyurk. alfavita, pp. 123–150.

Potapov L.P. 1953
Pishcha altaitsev (etnograficheskiy ocherk). *Sbornik MAE*, vol. XIV: 37–71.

Potapov L.P. 2001
Okhotnichiy promysel altaitsev (otrazheniye drevnetyurkskoi kultury v okhotnichyem promysle altaitsev). St. Petersburg: MAE RAN.

Propp V.Y. 1995
Russkiye agrarnye prazdniki: (Opyt ist.-etnogr. issledovaniya). St. Petersburg: Terra-Azbuka.

Sambu I.U. 1974
Iz istorii tuvinskikh igr: (Ist.-etnogr. ocherk). Kyzyl: Tuvin. kn. izd.

Sat Bril L. 1987
Pièces du jeu d'échecs tuva. *Etudes Mongoles et Sibériennes*, No. 18: 75–89.

Savenkov I.T. 1905
K voprosu ob evolyutsii shakhmatnoi igry: Sravnitelno-etnograficheskiy ocherk. *Etnograficheskoye obozreniye*, No. 1: 1–128.

Slovar altaiskogo i aladagskogo narechiy tyurkskogo yazyka. 1884
V. Verbitsky (ed.). Kazan: Pravoslav. missioner. obshch.

Tadina N.A., Arzyutov D.V., Kisel V.A. 2012
Ak-Jang na Altae: Diskurs i praktiki "religioznogo vozrozhdeniya". In *Istoriko-kulturnoye naslediye i dukhovnye tsennosti Rossii*. Moscow: ROSSPEN, pp. 407–414.

Tokarev S.A. 1947
Perezhitki rodovogo kulta u altaitsev. *TIE*, vol. I: 139–158.

Tyukhteneva S.P. 1995
Ob evolyutsii kulta gor u altaitsev. In *Shamanizm i ranniye religioznye predstavleniya*. Moscow: IEA RAN, pp. 173–179.

Tyukhteneva S.P. 2009
Zemlya. Voda. Khan Altai: Etnicheskaya kultura altaitsev v XX veke. Elista: Izd. Kalmyk. Gos. Univ.

Ulagashev N.U. 1941
Altai-Buchai: Oirotskiy narodnyi epos. Novosibirsk: Obl. gos. izd.

Vainshtein S.I. 1974
Istoriya narodnogo iskusstva Tuvy. Moscow: Nauka.

Ventsel A. 2006
Hunter–herder continuum in Anabarski District, NW Sakha, Siberia, Russian Federation. *Nomadic Peoples*, vol. 10 (2): 68–86.

Wagner R. 2011
The chess of kinship and the kinship of chess. *HAU: Journal of Ethnographic Theory*, vol. 1 (1): 165–177.

Willerslev R. 2004
Not animal, not not-animal: Hunting, imitation and empathetic knowledge among the Siberian Yukaghirs. *Journal of the Royal Anthropological Institute*, vol. 10 (3): 629–652.

Yadagayev G. 2004
Altai shatra. *Altaidyng Cholmony*, 10.04: 4.

Zamyatin S.N. 1951
O starinnykh russkikh shakhmatakh. In *Istoricheskiy pamyatnik russkogo arkticheskogo moreplavaniya XVII veka: Arkheologicheskiye nakhodki na ostrove Faddeya i na beregu zaliva Simsa*. Leningrad, Moscow: Izd. Glavsevmorputi, pp. 147–152.

Zelenin D.K. 1929
Tabu slov u narodov Vostochnoi Evropy i Severnoi Azii. Pt. 1: Zaprety na okhote i inykh promyslakh. *Sbornik MAE*, vol. VIII: 1–151.

Zelenin D.K. 1991
Vostochnoslavyanskaya etnografiya. Moscow: Nauka.

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The Distribution of Bashkir Tribes Before and During their Integration into the Russian State*

The ethnic geography of Bashkiria immediately before and during its absorption by the Russian Empire is a matter of debate, because few relevant written or archaeological sources are available. The only reliable sources are the toponymy and hydronymy of Bashkir historical legends, and genealogies (shezhere). Ethnographers believe that the legends originated at the early stage of feudalism; shezhere, at the time of the absorption of Bashkiria by the empire. Eventually, legends became the only documentation proving Bashkirs' ownership of land. The preserved legends and shezhere, taken together, mention some eighty names of rivers and mountains matching modern toponyms of the Southern Urals and mirroring the ethnic geography of medieval Bashkiria. Our comparative analysis suggests that the boundaries of "Old Bashkiria" passed between the Dem River valley and the western foothills of the Southern Urals, as well as along the eastern foothills of the Southern Urals, from the Miass River in the north to the Sakmar River in the south. During the 15th and 16th centuries, these borders remained relatively stable, shifting mostly southward because of the annexation of territories emptied after Ivan IV had conquered the Kazan Khanate and ousted the Nogais from Southern Urals.

Keywords: *Kazan Khanate, Siberian Khanate, Nogai Horde, folklore, shezhere, toponymy, hydronymy, Bugulma-Belebey Upland.*

Introduction

The subject of the socio-economic and political history of Bashkir tribes, in the period between the dissipation of the Golden Horde and the integration of the Bashkirs into the Russian State, has a quite comprehensive (though rather repetitive) historiography. The studies of the researchers who have addressed this subject consider mainly the socio-political and economic situation of the Bashkirs through the prism of the influence of such factors as the division of the territory of the Bashkir tribes among the Kazan Khanate, the Siberian Khanate, and the Nogai Horde; and the extension of the socio-political and administrative systems of these states to the Bashkirs.

Such approaches are embodied in two large monographs by Bashkir historians—published almost simultaneously—that cover the history of Bashkortostan from the earliest times to the 16th century.

The authors of one monograph are of opinion that during the period under consideration, the main part of the territory of present-day Bashkortostan was united under the reign of Nogai Aknazar Khan, who established here the "clear principles of administrative division" (Mazhitov, Sultanova, 1994: 321).

According to the authors of the other, "in the second half of the 15th to the first half of the 16th centuries, the Bashkirs were under the sovereignty of three political

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entities. The feudal system, which existed in the Nogai Horde, the Kazan and the Siberian Khanates, was extended to Bashkiria." (Istoriya…, 1997: 134). The discrepancies, although small, are significant, since the first paper implies preservation by the Bashkirs (albeit in the subordinate form) of their own statehood, which was allegedly in place even before the Mongolian invasion (Mazhitov, Sultanova, 1994: 208); while the second study suggests full dissipation not only of the "Bashkir statehood", but also of the ethnogeographic formation (named by R.G. Kuzeyev the "Old Bashkiria") that in his opinion originated in the 10th century, with its center on the Bugulma-Belebey Upland (1974: 435–439, 486).

Such a wide diversity of opinion stems from the fact that historians actually have neither documentary (written) nor physical (archaeological) materials pertaining to the period of the 15th to early 16th century. The absence of written sources is explained by obvious circumstances: the states that absorbed the territory of present-day Bashkortostan, and the tribes that inhabited this, represented rather loose ethnopolitical formations with very amorphous boundaries. Within these boundaries, the territory of present-day Bashkortostan had always been a peripheral region, an object of social exploitation, and a source of yasak (tribute in furs). Therefore, the archives, even if they existed in the medieval Kazan or Isker (the capital of the Siberian Khanate) could hardly have preserved any detailed information about the peoples and tribes of our region (except, perhaps, the amount of yasak imposed on them). In addition, the circumstances in which Kazan and Isker, along with all their service and administrative buildings, found themselves under the reign of the "White Tsar", were such that any written documents simply could not be preserved.

As for the archaeological materials of the 15th–16th centuries, their accumulation took place under the influence of both objective and subjective factors.

The first factors involve the establishment of Islam in the Bashkir ethnic culture and, accordingly, eradication of paganism in the burial rite, which entailed leveling of any archaeological features pointing to the social or ethnic identity of the buried. Therefore, excavations of medieval cemeteries are not promising in terms of the ethnocultural history. Excavations of settlements and fortresses of that period are of equally little promise, since where they used to be, villages and towns are now located, whose centuries-old existence has eliminated the last remains of hoary antiquity. The lack of sufficient interest in obtaining empirical data on the said period among modern researchers can be attributed to the difficulties of the second, subjective factor.

At the same time, the source-study situation vis-à-vis the problem under consideration is not as hopeless as might appear at first sight. The historical memory of the Bashkir people has preserved and brought to the present day a comprehensive body of folklore sources and genealogies (shezhere) that, with all ambiguity of their assessments as a historical source, take "pride of place" (R.G. Kuzeyev) in historical schemes. According to Kuzeyev (and the researchers of Bashkir folklore have no objections to this), "heroic motifs in Bashkir folk art ('Ural-Batyr', 'Kuzy-Kurpes and Mayan-Khalu', 'Kara Yurga', 'Kungar Buga', 'Kusyak Biy', and others) mirror, by means of poetical images, events typical of a medieval nomadic society. These literary monuments provide considerable material, not only for the reconstruction of some Bashkir ethnic historical scenes, but also for characterization of the internal social structure and social life of society" (Kuzeyev, 1974: 37). Kuzeyev assesses Bashkir shezhere in a similar way, defining them (with a certain convention) as "genealogical chronicles" (Ibid.: 33).

The present paper deals with information provided by Bashkir legends and shezhere that allows an idea to be formed of the spatial-geographical environment that was inhabited by the Bashkir tribes in the period of the creation of these epic poems; and since environment is vital to the process of ethnogenesis, it is essential to get an idea of what the former was.

Toponymy and hydronymy of Bashkir historical legends and shezhere

The list of locations involved in the historical geography of the Bashkir tribes during the Middle Ages is quite extensive (Table 1). The easternmost geographical point named in the Bashkir epic is the *Irtysh River*, over which Ural-Batyr drove enemies away (the Kongur-Buga epic), and in the upper reaches of which Karabay ("the most respected man in the Bashkir race") lived before several Bashkir families joined him (the Kuz-Kurpyach epic).

However, it is difficult to suggest where further events of the Kuz-Kurpyach epic unfolded. For example, it mentions the Karatash Mountain and the Kaz Kule Lake as the places of Karabay's camps. The locations of these geographical features cannot be identified; but, according to note No. 6 to the Kuz-Kurpyach epic, the Karatash Mountain is known in the Abzelilovsky District of Bashkortostan (Bashkirskoye narodnoye tvorchestvo, 1987: 512). In the *Irtysh* area, there were nomad camps of Akkubyak, one of the batyrs released by Aldar from the demon's captivity (Aldar and Zukhra). As follows from the epic context, Akkubyak and Aldar belonged to different tribes.

Among the Trans-Ural rivers, the folkloric texts mention the *Miass River* as the frontier beyond which Sukem-Batyr overtook and defeated the troops of Kusyum-Khan (the Sukem-Batyr kubair).

Table 1. **Geographical features mentioned in Bashkir legends**

Feature	Legend	Mention in the legend
1	2	3
Iremel Mountain	Kongur-Buga	Tandysa saw the Idel source near the Iremel Mountain
	Aldar and Zukhra	Mountain located two-days' journey from the nomad camps of Aldar near the Yaik River
	The Legend of Mamai-Khan	Birth-place of Musa, the father of Mamai
	Mergen and Mayankhylu	Assembly point of batyrs raised against Nugai-Khan
Irendyk	Kongur-Buga	Locality to the south of Alatau
	Idukai and Muradym	Possessions of bey who accepted allegiance of the Golden Horde
	Erense-sesen	Pasture grounds proposed by Kazakh khan Abulkhair to Bashkir tarkhan Akmambet for wintering
Sakmar	Akbuzat	One of the rivers which bed was cut through by the sons of Ural-Batyr under his will
	Kara-Yurga	On the banks of Sakmar, hunter Kusyarbai lived. Sakmar was the boundary, after crossing which Maktymkhylu ceased to be the wife of Ablyai
	Kongur-Buga	Motherland of Tandysa, about which old woman Gyulkhylu sang to her
	Muiten-Bey	Possessions of Muiten-Bey
Idel (Agidel)	Akbuzat	One of the rivers which bed was cut through by the sons of Ural-Batyr under his will
	Idukai and Muradym	Territories of nomad camps of the Yurmaty and Tabyn Bashkirs
		One of six rivers flowing from Uraltau ("like an udder having six nipples")
Upper reaches of Agidel	Kara-Yurga	Nomad camps of Masem-Bai
Upper reaches of Ak-Idil, Tyungak-Tau Mountain	Aldar and Zukhra	Place of nomad camps of the "semirodtsy" Bashkirs
South bend of Agidel	Ek-Mergen	Place of summer pasture of old woman Tugyzak-Ebi and her children
Yaik	Akbuzat	One of the rivers which bed was cut through by the sons of Ural-Batyr under his will
	Idukai and Muradym	One of six rivers flowing from Uraltau ("like an udder having six nipples")
	Mergen and Mayankhylu	Possessions of Nugai-Khan
Near the Yaik sources – thick forest	The Legend of Mamai-Khan	Place of summer pasture of Musa, the father of Mamai
Nugush	Akbuzat	One of the rivers which bed was cut through by the sons of Ural-Batyr under his will
	Idukai and Muradym	Territories of nomad camps of the Yurmaty and Tabyn Bashkirs
		One of six rivers flowing from Uraltau ("like an udder having six nipples")

Table 1 (continued)

1	2	3
Irtysh River	Kongur-Buga	Ural-Batyr drove enemies beyond the Irtysh River
	Kuz-Kurpyach	In the upper reaches of the Irtysh River, Karabay, the most respected man in the Bashkir race, lived
	Aldar and Zukhra	Nomad camps of Akkubyak, one of the batyrs released by Aldar from the demon's captivity
Ashkadar	Aldar and Zukhra	One of the points in the journey of Aldar and Zukhra from the nomad camp of Kidras to the camps of Aldar
	Mergen and Mayankhylu	Possessions of Nugai-Khan
Dim	Mergen and Mayankhylu	Same
	Zayatulyak and Khyukhylu	Habitation place of Sakmar Khan between the Aslykul Lake and the Dim River
	Aldar and Zukhra	The River from which banks guests came to the feast of Zukhra's father
Asylykul, Aslykul	Zayatulyak and Khyukhylu	Habitation place of Sakmar Khan between the Aslykul Lake and the Dim River
Karagas Mountain on the southern bank of Lake Asylykul		Mountain where tulpar-horse waited for his master Zayatulyak
Lake Kandra	Aldar and Zukhra	According to Zukhra, her father Kidryas, while wandering over the Karmasan and Chermasan rivers, reached Lake Kandry in the mid-summer
Balkantau Mountain		Motherland of Zayatulyak in his reply to the Water King. Sacred site of the Dem Bashkirs, resting place of Zayatulyak and Khyukhylu
Zilair River	Kongur-Buga	River on the way of Tandysa who went to search for the cow Kongur-Buga
Mokhak River		Tandysa mentioned it in her reply to the old woman Gyulkhylu
Alatau Mountain		Mountain to the east and west of the Ural
Kurtash, Ryaz, Kagytash mountains		Located a little to the right (i.e. to the west according to the Turkic coordinate system) of the Alatau ridge
Kyrkty Mountain		To the south of the Alatau ridge
Sakhra Mountain		To the north of the Alatau ridge
Karalyk and Irgiz	Uzak-Tuzak—the last from the clan of Balabashnyaks	Destination point of migration route of the Balabashnyaks (Pechenegs) from the Cis-Azov region to the Ural
Karatash Mountain	Kuz-Kurpyach	In the vicinity of Karabay's camps
Lake Kaz-Kule		Place of summer pasture of Karabay
Territory of the Ufa River mouth, "flowing into Ak-Idil, and downstream the Ak-Idil River on both banks, to the Cholman-Idil mouth. Our camps occupy not only the banks of this river, but also the territory of five-days' journey on either side".	Aldar and Zukhra	Story of Zukhra about the nomad camps of her father Kidryas

Table 1 (end)

1	2	3
Bir River	Aldar and Zukhra	The River from which banks guests came to the feast of Zukhra's father
Lake Achely		Points in the journey of Aldar and Zukhra from the nomad camp of Kidras to the camps of Aldar
Urshak		
Gorkiy Uzyan flowing into Urshak		
Uzyan, Kasmart, Ik rivers	Idukai and Muradym	Rivers flowing from Uraltau ("like an udder having six nipples")
Saelmysh	Muiten-Bey	Possessions of Muiten-Bey
Bishtamak, Kizil, Oisyuk	The Legend of Mamai-Khan	Place of winter pastures of Musa, the father of Mamai
Tanyp River	Eget-Kypsak and Bashkir girl	Place where Eget-Kypsak met the Bashkir girl
Miass River	Sukem-Batyr	Beyond the Miass River, Sukem-Batyr overtook his enemies
Yuraktau, Kuksyatau	Bilal and Dusyan	Mountains at the sight of which an old Bashkir, who lost his sons, grieves
Atash	Erense-sesen	Pasture grounds proposed for wintering

Locations of the Bashkir Trans-Urals are more frequently mentioned in the epic poems. First of all, these are *upper reaches of the Agidel River*, the territory of nomad camps of Masem-Bai (the Kara-Yurga epic), the *Iremel Mountain* near the Agidel sources, which Tandysa saw during her wanderings around the Urals (Kongur-Buga); the same mountain is referred to as the birth-place of Musa, the father of Mamai-Khan (The Legend of Mamai-Khan); as the place located two days' journey from the nomad camps of Aldar near the Yaik River (Aldar and Zukhra); and as the assembly point of batyrs raised by Mergen against Nugai-Khan (Ek-Mergen). In the upper reaches of Agidel, the *Tyungak-Tau Mountain* is mentioned as the place of nomad camps of the "semirodtsy" Bashkirs (Aldar and Zukhra). In the forests near *the Yaik sources*, Musa, the father of Mamai-Khan, held his *yaylyau* ('summer pastures') (The Legend of Mamai-Khan).

The *Irendyk Valley* is the place proposed by Kazakh khan Abulkhair to Bashkir tarkhan Akmambet for wintering (Erense-sesen), as the possession of bey who accepted allegiance of the Golden Horde (Idukai and Muradym), and as the locality passed by Tandysa on her way to Alatau (Kongur-Buga).

The *Sakmar River* is one of the water streams whose bed was cut through in the Ural Mountains by the sons of Ural-Batyr under his will (Akbuzat), the habitat of hunter Kusyarbai, and the boundary, after crossing which Maktymkhylu ceases to be the wife of Ablyai (Kara-Yurga), the motherland of Tandysa, about which old woman Gyulkhylu sang to her (Kongur-Buga), and the possessions of Muiten-Bey (Muiten-Bey).

The *Nugush River* is also one of the water streams whose bed was cut through by the sons of Ural-Batyr (Akbuzat), the territory of nomad camps of the Yurmaty Bashkirs, simply one of the rivers flowing from Uraltau (Idukai and Muradym), etc. (Table 1).

Such toponyms mentioned in Bashkir epic poems as the *Bir River* and *Cholman-Idil (Kama) River*, the *Kandra (Kandry-Kul) Lake* (the Aldar and Zukhra epic) and *Aslykul Lake* (Zayatulyak and Khyukhylu) allow determination of the western boundary of the ethnos's area. These are territories of Bashkir nomad camps: the Cholman-Idil River and the Kandra Lake meant the boundaries of nomad camps of Kidryas, father of Zukhra; guests came to the wedding of Aldar and Zukhra from the banks of the Bir River; between the Aslykul Lake and the Dim River, nomad camps of legendary Sakmar Khan were located.

Thus, geographical realities captured in Bashkir traditions and legends mark the space lodged in the historical memory of the Bashkir people, the spatial-geographic coordinates of their world-view and world-perception (Fig. 1).

According to the definition given by folklore researchers, the formation of the Bashkir epic took place "from the period of disintegration of the primitive communal system to the origin of capitalist relations in Bashkiria".

The oldest epic legends of the Bashkirs are "Ural-Batyr" and "Akbuzat" kubairs (Ibid.: 15, 17). "Ural-

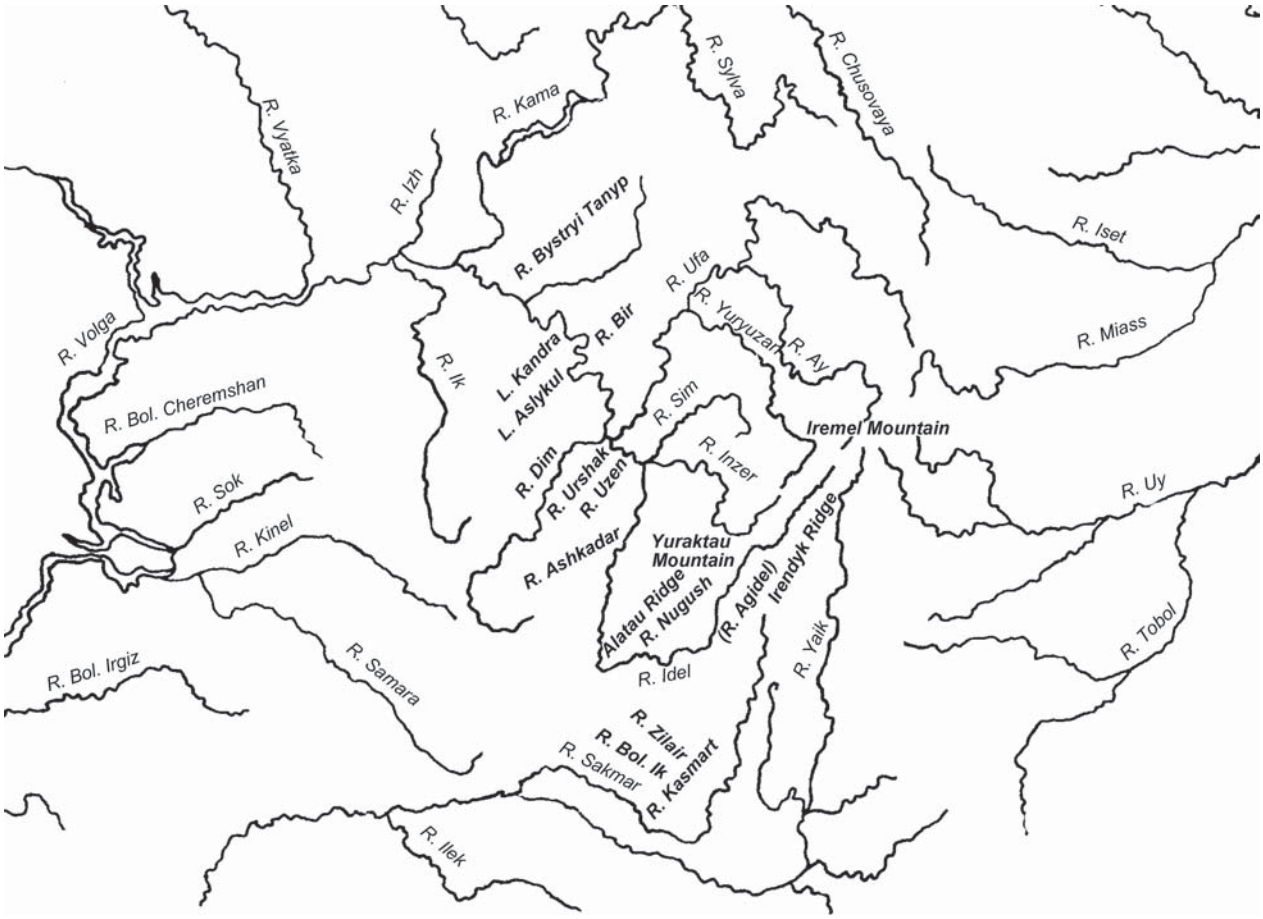

Fig. 1. Map of toponyms and hydronyms of the Southern Urals mentioned in Bashkir traditions and legends (marked in bold italics).

Batyr" does not contain any real toponyms, oronyms, or hydronyms*, while "Akbuzat" includes them: these are the Yaik, Sakmar, and Nugush rivers. However, it is hardly reasonable to doubt that the later Bashkir legends had already taken shape in the period of distribution of ancient Bashkir tribes in the Southern Urals. Consequently, by mapping the geographical realities mentioned in them, we can obtain a map of areas that lay at the heart of the world-perception of the ancient Bashkirs.

Actually, this map fully coincides with the map of the distribution of Bashkir tribes in the 13th–14th centuries reconstructed by Kuzeyev on the basis of historical and ethnographic data (1974: Maps No. 3–10). In real geographic coordinates, these are territories located to the east and northeast of the Bugulma-Belebey Upland, in the western and eastern foothills of the Southern Urals (Fig. 1).

Information on the territories of dispersal of Bashkir tribes during their integration into the Russian State is contained in Bashkir shezhere, which were compiled (according to the content of surviving genealogies) just at that time or somewhat later; or in the period when the Bashkir people were trying to save the clan system from internal disintegration and external destruction (Bashkirskiye rodoslovniye, 2002: 28). These also give real toponyms and hydronyms, designating the habitat territories of one tribe or another (Table 2). Plotted on a geographical map, toponyms and hydronyms indicated in shezhere coincide with those mentioned in the Bashkir epic. All geographical points embedded in the historical memory of the Bashkirs and captured in the genealogies (shezhere) are beyond the limits of the Bugulma-Belebey Upland, in the foothills of the Southern Urals or in the steppe areas adjacent in the south (Fig. 2).

First of all, this indicates that the Bugulma-Belebey Upland wasn't retained in the historical memory of the Bashkirs as the center of "Old Bashkiria" (Kuzeyev, 1974: 438). This is probably because in reality it was not such a center. This is quite natural, since the economic

*In fact, the "Ural-Batyr" epic is very difficult to use as a source of the historical ethnography and geography of the Bashkirs: the time of its origin is unknown, and it does not reflect any historical or geographical realities.

Table 2. **Geographical features mentioned in Bashkir shezhere**

Feature	Shezhere	Mention in the shezhere
Zay and Seshma rivers	Yurmaty No. 2	Places of Nogai nomad camps and yurts of Yurmatys' ancestors
Kara-Elga (Chernaya Rechka)		Place where in 1409 the grave of the saint was found
Shadlyk (Shatlyk) River		Place of Yurmaty nomad camps after 1409
Sakmara, Dzhaik (Ural), Idel rivers		Places of Nogai nomad camps
Nugush and Kukush rivers		Upper and lower borders of the former Nogai nomad camps, which were occupied by Yurmaty Bashkirs
Ashkadar and Nugush rivers		The first tyuba of Yurmaty Bashkirs
Tor and Seleuk rivers		The second tyuba of Yurmaty Bashkirs
Turatau, Shakhtau, Kushtau mountains from the Sterli River mouth, upper reaches of Kuganak and Urshak, Asava River		The third tyuba of Yurmaty Bashkirs
Mouth of Urshak and Asava rivers, Yuraktau Mountain, Kratugay Valley, Zigan, upper reaches of Kalaman, Tor, Shineshma		The fourth tyuba of Yurmaty Bashkirs
Sukhailya, Tyuryushlya, Tashlyir rivers	Yurmaty No. 3	Places of Yurmaty nomad camps
Middle reach of the Dzhaik (Ural) River from Sarymsak to Buzsavyl; Kizil, Sakmara, Zilair, Asele, Uskalyk, Sureni, Saelmysh, Menyu, Krivle, Irtyubyak, Sarlak, Mryaushli, Kalmak, Bishazy, Ilimsat, Laimberdy, Tanalyk rivers	Deed of land partition, issued by Ivan the Terrible, shezhere No. 9	Possessions of the Tungaurs and Usergans
Sarymsak, Kamelik rivers, Lake Dyurtkul		Possessions of the Burdzhans
Lands along the Dzhaik River from Saraichyk to Buzdzhava (Buzsavyl), Sakmara, Asele, Uskalyk, Sureni, Menyu, Irtyubyak, Charlak, Mryaushli, upper reaches of Kalmash, Laimberdy, Tanalyk, Kamyshlau, Dzhim, Uk Mountain, Lake Dyurtkul	Deed of land partition, issued by Ivan the Terrible, shezhere No. 10	Possessions of the Usergans, Kipchaks, and Tamyans
Miach (Miass) River	Iryakty genealogies (northwestern Bashkirs)	Habitation place of Iryakte ancestor
	Ayle genealogy No. 11	Place where Bekatun, Ishtyak's son, has come, and where he lived
Ay River	Same	Place where Yanesh, Babesh, and other Ay people's ancestors lived
Ufa River mouth	Genealogy of the Yumran-Tabynskaya Volost	Habitation place of Duvan-Tabyns, Kichi-Tabyns, and 12 other Tabyn clans
Samara River and its tributary, Tok River		Place of settlement of Tuktar-Bey, the son of Khani Uglan who came from Astrakhan
Chusovaya, Chulman (Kama) rivers, Perm, Osa, Okhansk, Barda, Tulva	Iryakty genealogies (northwestern Bashkirs)	Place of wanderings of Abdal-Bey, ancestor of Iryakty people
Tanyp River		Habitation place of Tazlar Bashkirs
Buy River		Habitation place of Uran Bashkirs
Tyuy, Baiki rivers		Habitation place of Iryakte Bashkirs
Mellya River mouth	Same	Place where Abdal-Bey found free lands for the future settlement

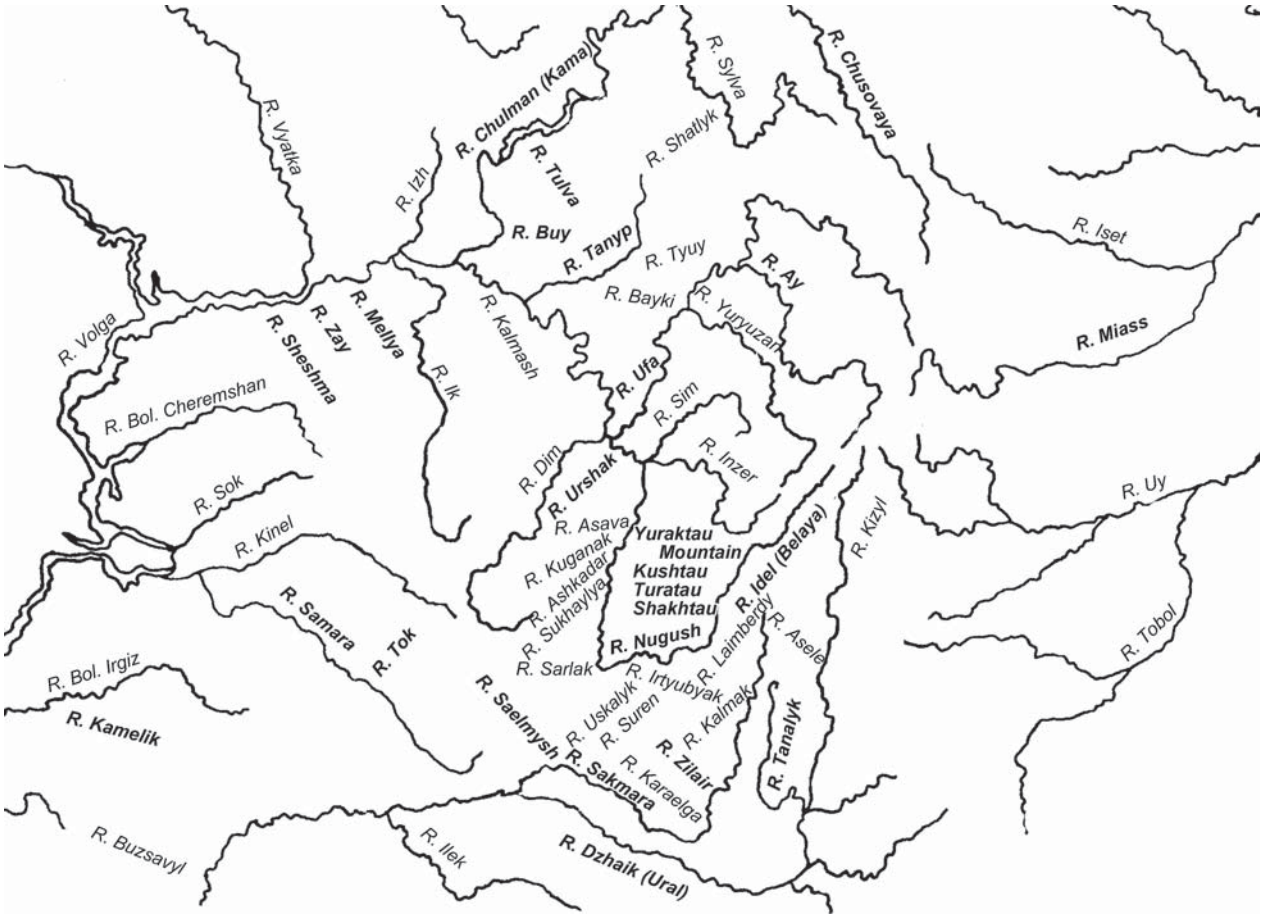

Fig. 2. Map of toponyms and hydronyms mentioned in Bashkir shezhere (marked in bold italics).

and cultural life of medieval Bashkir tribes was based on nomadic cattle breeding. The Bugulma-Belebey Upland, with a form of relief heavily weathered, and dissected by the beds of rivers flowing down from it and located at an elevation of 200–480 m above sea level, was typical forest-steppe even in the middle of the 19th century (Kuzeyev, 1978: 50, fig. 2). It is characterized by vertical differentiation of landscape: the entrenchment depth of the beds of rivers flowing down is 100–150 m, the slopes of syrts are step-like, and their tops are covered by forests (Yaparov, 2005).

Snow cover, the thickness of which is 40–60 cm, is preserved on the slopes of ravines and riverbeds for 160–180 days, till the first days of May. By the middle of August, the herbaceous cover on the upland slopes fades, and the rivers dry up. Therefore, the ancient Bashkirs, even if they used the ecological potential of the Bugulma-Belebey Upland, could have done so only for a very limited time, and went for wintering to the steppe, to the reedy flood-plains of the Ural and Samara rivers, or to the Caspian and Aral steppes.

But their descendants, not later than before the Mongol conquest of Eastern Europe and the origin of the Golden Horde, could have acted in the same way. Again, it was obviously for a good reason that exactly in the 13th–14th centuries (according to Kuzeyev) the distribution territory of the Bashkir tribes was rather limited: from the upstream flow of the Ural River in the east to the lower reaches of the Belaya River and the Dem River in the west; this was the real, and not the mythological "Old Bashkiria". The formation of its boundaries was undoubtedly influenced by administrative policy of the first Golden Horde khans, which was aimed at clearing East European steppe of the preceding Polovtsian-Kipchak population by transferring the latter to the outskirts of the Steppe (Fedorov-Davydov, 1973: 35–36).

According to the Bashkir shezhere, shortly before and during integration of the Bashkirs into the Russian State, the boundaries of the Bashkir ethnic territory were determined by several ethnopolitical factors. One of them was distribution of Nogai nomad camps up to the mouth of the Kama River (Trepavlov, 2002: 469); another one

was the resettlement of some Bashkir tribes (the Yurmats) in the lands released at the left bank of the Srednyaya Belaya River, after the departure of the Nogais as a result of the seizure of Kazan by the Russians (Bashkirskiye rodoslovniye, 2002: 57).

Conclusions

Information provided by Bashkir historical legends and genealogies (shezhere) allows a number of conclusions to be drawn regarding historical geography of the Bashkir tribes during the Late Middle Ages.

The territory of the Bugulma-Belebey Upland should be excluded from the area of consolidation and ethnic formation of the ancient Bashkirs.

According to the data reflected in Bashkir legends and shezhere, the boundary of "Old Bashkiria" passed between the Dem River valley and the western foothills of the Southern Urals, as well as along the eastern foothills of the Southern Urals from the Miass River in the north to the Sakmar River in the south.

In the 15th to early 16th century, the "Old Bashkiria" territory was actually limited by the valleys of the Southern Urals and the adjacent western and eastern foothills. The extension of its limits by inclusion of southern (steppe) expanses was prevented by Nogai nomad camps, which came up to the Ika River and the lower reaches of the Belaya River in the west; and to the Trans-Ural lakes, the Uy River, and the upper reaches of the Ural and Belaya rivers in the northeast (Trepavlov, 2011: 96–99). Extension to the north and northwest was hampered by the migration of the Kazan-Tatar population who fled from the troops of Ivan IV; and by the end of the 16th century, by the burgeoning military and economic expansion of the Moscow State (construction of the Trans-Kama Line, formation of the ancestral lands of the Stroganovs (Georgy, 1780: 18–20; Donnelly, 1968).

References

Bashkirskiye rodoslovniye. 2002
R.M. Bulgakova, M.K. Nadergulova (transl.), iss. I. Ufa: Kitap.

Bashkirskoye narodnoye tvorchestvo. 1987
Vol. 1: Epos. Ufa: Bash. kn. izd.

Donnelly A.S. 1968
The Russian Conquest of Bashkiria 1552–1740: A Case Study in Imperialism. New Haven; London: Yale Univ. Press.

Fedorov-Davydov G.A. 1973
Obshchestvennyi stroi Zolotoi Ordy. Moscow: Izd. Mosk. Gos. Univ.

Georgy J. 1780
Russia: or, A Compleat Historical Account of all the Nations which Compose that Empire, vol. 2. London.

Istoriya Bashkortostana s drevneishikh vremen do 60-kh godov XIX v. 1997
Ufa: Kitap.

Kuzeyev R.G. 1974
Proiskhoydeniye bashkirskogo naroda. Moscow: Nauka.

Kuzeyev R.G. 1978
Istoricheskaya etnografiya bashkirskogo naroda. Ufa: Bash. kn. izd.

Mazhitov N.A., Sultanova A.N. 1994
Istoriya Bashkortostana s drevneishikh vremen do XVI veka. Ufa: Kitap.

Trepavlov V.V. 2002
Istoriya Nogaiskoi Ordy. Moscow: Vost. lit.

Trepavlov V.V. 2011
Nogai v Bashkirii (XV–XVI vv.). In *Idem. Tyurkskiye narody srednevekovoi Evrazii: izbr. tr*. Kazan: Foliant, pp. 95–120.

Yaparov I.M. 2005
Bugulminsko-Belebeyevskaya vozvyshennost. In *Bashkirskaya entsiklopediya*, vol. 1. Ufa: Bash. entsikl., pp. 553–554.

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Mythological Characters of the Domestic Space in Russian Folk Beliefs: Lexicographic and Ethnographic Aspects*

Russian mythological characters relating to the domestic space are described on the basis of folkloric, ethnographic, and lexicographic sources. The integration of evidence has revealed transformations undergone by views of male and female spirits (the domovoy and kikimora, respectively), allowing us to compare local beliefs and stories featuring them in urban and rural areas of Russia, and to reconstruct common Russian ideas of home spirits with reference to the notion of linguistic and cultural literacy. The results demonstrate that the idea of domovoy is quite popular even among urban dwellers, generally matching traditional Russian beliefs. The domovoy is believed to be a home and family patron, either invisible or small and shaggy, an old man or a cat, supposed to be entertained with food and invited when moving to a new home. Unlike the image of the domovoy, that of the kikimora has undergone substantial changes. Modern urban residents view the kikimora mostly as an untidy, ugly woman, sometimes called kikimora bolotnaya, the second word being an adjective of boloto ('bog'), thus turning her into a forest rather than a domestic spirit. The idea of the kikimora as a home spirit is still held by villagers, who view her either as an undead being or as a bewitched item (doll). Domestic mythical characters, then, have changed without losing their topicality.

Keywords: *Russian mythology, lexicography, cultural literacy, folk beliefs, domovoy, kikimora, traditional culture.*

Introduction

In the worldview of the Russians, the house was not just a dwelling place for people, but also the place where mythological characters resided. Ethnographic and folkloric sources of the 19th–first half of the 20th century mention characters associated with the spaces of the house and yard. These characters differed in their locations, functions, and attitudes toward people, and included the *domovoy* ('house dwellers'), *kikimora*, *dvorovoy* ('yard dwellers'), *ovinnik* ('barn dwellers'), *gumennik* ('barnyard dwellers'), and *bannik* ('bathhouse dwellers'). There were also female modifications of home characters: *domovikha*, *susedka*, *ovinnitsa*, *bannitsa* (*obderikha*), etc. Some of them (*domovoy*, *kikimora*, *bannik*) have remained the popular subjects of oral non-fairytale prose and ethnographic materials of the late

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20th–early 21st century; others (*ovinnik*, *gumennik*) have lost their relevance owing to the disappearance of their "habitation areas".

In this article, we will discuss two mythological characters of the domestic space, the *domovoy* and *kikimora*. This choice is justified, firstly, by their wide popularity among the urban population and in oral non-fairytale prose; secondly, by the functional and attitudinal opposition of these characters. The study is based on the following sources: field materials (hereafter—FMA)*, which are the results of a questionnaire survey**, as well as ordinary dictionaries and dictionaries of linguistic culture. In the lexicographic description of *domovoy* and *kikimora*, it would be advisable to consider: a) their definition as mythological characters, b) the description of the image (external appearance, typical actions, and attitude toward people), and c) the use of this unit for describing a person. This sequence makes it possible to form a sufficiently complete notion of the *domovoy* and *kikimora* as mythological characters, and to trace the development of their images in the diachronic aspect.

The concept of linguistic and cultural literacy is based on the idea of E.D. Hirsch concerning accountability and accessibility of cultural knowledge (1988). It may be formulated as follows: there exists a certain amount of linguo-cultural knowledge, available for the carriers of a certain linguistic culture, needed for communication, and thus for research by the representatives of other cultures and in some cases by those of their own linguistic culture.

The interdisciplinary approach for the study makes it possible to identify a complete picture of the contemporary notions about home spirits among the inhabitants of Russia, and to offer effective lexicographic interpretation of these units in terms of communication.

Domovoy

According to the materials of ethnography and folklore, the *domovoy* is a home spirit, generic ancestor, who protects the house, people, and cattle from possible misfortunes, thieves, witchcraft, and evil spirits. It was believed that "*without the domovoy, there is no life in the house; the house is not a house, but an empty space if there is no domovoy; without the keeper it is bad for the people to live in the house, and the cattle do not live*" (FMA, Novgorod Region, Novosibirsk Region, and Omsk Region). It was customary to gain the favor of the home spirit giving him food, so he would be kind to house dwellers and contribute to proliferation of wealth and offspring of cattle (for more details on the *domovoy* in the traditional Russian beliefs, see (Dal, 2008: 166–197; Maksimov, 1903: 31–50; Pomerantseva, 1975: 93–117; Vlasova, 1998: 139–159; Vinogradova, 2000: 271–288; Levkievskaya, 2000: 276–317; Krinichnaya, 2004: 26–245)).

The Russian folk tradition knew many types of home spirits: *domovoy*, *khozyain* ('keeper of the house'), *dedushka* ('old man'), *susedko* ('neighbor'), *kormilets* ('provider'), *bolshak*, *domovik*, *domozhil*, *domozhir*, *dobrozhil*, *domosedushko*, *zhikhar*, *zhitel*, *izbnoy*, *lizun*, *gnetok*, *sysoy*, *batanushko*, etc. (Dal, 2008: 166; Cherepanova, 1983: 25, 58; Vlasova, 1998: 134, 139, 306). According to our own data, the urban residents most often called him "*domovoy*" or "*domashniy khozyain*" ('home keeper'). The name *susedko* was common among the Russians living in the Urals, in the Tyumen Region, in the Altai, and in Eastern Siberia; in other regions of Western Siberia (Novosibirsk Region, Omsk Region) and in European Russia (Leningrad Region, Novgorod Region, and Pskov Region), he is usually called "*khozyain*" or "*domovoy*". In rural areas, older people often tried to avoid the word "*domovoy*" referring to the spirit in a figurative manner: *on* ('he'), *sam* ('he himself'), *khozyain* ('keeper'), or *dedushka* ('old man'). "*He lives with us behind the stove; he would jump out of there. Small, shaggy, we could not really see him well; he jumped out and immediately ran back*" (FMA, Omsk Region).

The *domovoy* was believed to have an anthropomorphic (small man, short shaggy man, gray-haired old man, or the double of the home owner) or zoomorphic (cat, mouse, snake, rooster, dog, weasel, or bear) form. He could have rudimentary phytomorphic features (the veiled image of a tree: wood stump, broom, coniferous branch "*matka*/*matoshnik*" were understood as emanations of the *domovoy*) or fire features (red shirt or hat, "fiery eyes", his localization in the chimney behind the stove, blue light as an attribute of the *domovoy*) (Krinichnaya, 2004: 119–139). However, most frequently, this home spirit remained invisible, and his presence in the house was manifested by sounds. If for no apparent reason doors would bang, dishes would clink, the wind would howl in the chimney, or things would get lost and then suddenly found, people said that the *domovoy* was up to mischief. Being hairy and bearded were the common features of the *domovoy*. Since hair in folk beliefs was conceptualized as a concentration of life and magical power, the hairiness of the home spirit was considered to be a pledge of prosperity

*These materials were collected by O.V. Golubkova in the Novosibirsk Region, Omsk Region, Tyumen Region (the Khanty-Mansi Autonomous Okrug–Yugra, the Yamalo-Nenets Autonomous Okrug), Leningrad Region, Pskov Region, Novgorod Region, Vologda Region, Kirov Region, and the Altai Territory from 1999–2015.

**A survey of the residents of Novosibirsk, Moscow, St. Petersburg, Omsk, Tomsk, Barnaul, and other cities, conducted in 2015 by O.K. Ansimova and O.V. Golubkova for identifying beliefs concerning the mythological characters among urban residents.

and wealth. The meaning of hairiness of the *domovoy* was clearly manifested in yuletide fortunetelling, which was widely practiced in various regions of Russia.

In rural areas (both in Siberia and in European Russia), the *domovoy* was considered a protector of the house and yard together with people and domestic animals. He might dwell in several locations: behind the stove, in the chimney, or in the *pechurka* (small niche in the stove wall), under the *golbets* (low box near the Russian stove which contained the passageway to the basement), under the floor, in the attic, in the cattle shed, or in the woodshed. At the same time, the informants always spoke about the same character—the home keeper whose traces they would find in various parts of the house and yard. In our field research, we could not find any division of household spirits into specifically house spirits and yard spirits. Bath spirits (*bannik*, *obderikha*), which were described as the most dangerous and malicious, were assigned to a separate category. Since the localization of these spirits was associated with village steam baths, they were not relevant for urban residents.

The home keeper has been universally described as a good spirit, defender, and patron, which corresponded to the notion of the *domovoy* as a generic ancestor. "*If susedko liked someone, he would braid his hair. He would entangle hair, so you couldn't comb it, and you shouldn't cut it, or else he might get offended*" (FMA, the Altai Territory).

A special role of the *domovoy* was his ability to predict human fate and possibly influence it in some way. It was believed that the *domovoy* appeared (let himself be seen or touched) on the eve of an important event in a person's life. The *domovoy* might show his presence before a wedding, "*At night, a shaggy bear fell on me and started to suffocate me. This was a domovoy who was driving me out of the house. I soon got married"* (FMA, Novosibirsk Region); before moving to a new home, the dwellers were reminded not to forget to invite him, "*You should surely invite him to a new house, otherwise he will not go, but will remain [where he was]. Only the kikimora comes without an invitation*" (FMA, Novgorod Region). People believed that the *domovoy* cried foretelling the death of someone from the household; he knocked on the window or clinked dishes on the eve of the death of relatives. Thus, by predicting events and influencing the fate of the family members, the *domovoy* revealed himself as a restless soul of a deceased relative or ancestor (for more details, see (Golubkova, 2009: 21–260)). In the common Russian tradition, the corners in the house, the stove, the basement, or the threshold were in some way related to burial, be it a construction sacrifice or an ancestor, which went back to totemic characters; the *domovoy* was the embodiment of an ancestor's soul which became the soul of the house and the family (Krinichnaya, 2004: 150–155, 175). "*When grandfather died, the domovoy bothered us for forty days. Something rattled in the kitchen, pots fell, the root cellar collapsed*" (FMA, Novosibirsk Region). "*The domovoy is the main person in the house. You need to honor him like your parents. When I prepare commemoration of my parents, I also put out food for the domovoy*" (FMA, Pskov Region).

According to field data and the results of the survey, the most common zoomorphic outlook of the *domovoy* was the image of the cat: "*The keeper turns into a cat and walks around the house at night; I have seen this many times*" (FMA, Omsk Region). In the traditional Russian culture, cats were one of the most sacralized animals of the domestic space. Just like an icon, cats were not bought but received in exchange (Balov, 1891: 218); it was considered a sin to kill a cat (Afanasiev, 1865: 647–651). Identification of the home spirit with a cat was apparently caused by the fact that the cat, just like the *domovoy*, seemed to be the image of a reborn soul, a kind of emanation of the ancestor (for more details, see (Golubkova, 2009: 189–196)).

It was a habit to invite the *domovoy* when moving to a new house. His "transport" was usually a broom, a bag, old felt boot or slipper (an equivalent replacement of the bast shoe). "*On the day of the move you need to take a new broom and sweep all the corners, saying, 'Our keeper, father, come with us to live in the new house'. In the new house, you need to put the broom behind the stove with its head up, and this broom should be no longer used for sweeping*" (FMA, Novosibirsk Region). The ritual with a broom was obviously an echo of a sacrifice, one of the purposes of which was the expulsion of the "evil" (outsiders', other people's) *domovoy*, when a rooster was sacrificed and its blood was put on a broom which was then used to sweep all the corners of the house and yard. The broom dipped in the sacrificial blood was perceived as a strengthened and renewed emanation of the *domovoy*, which enabled it to drive away the stray "evil" *domovoy* (Krinichnaya, 2004: 124). People would often let a cat (sometimes a rooster) first enter a new house, and then the owner of the house would enter with an icon, followed by his wife carrying attributes symbolizing the *domovoy* or fulfilling the role of his "transport" (broom, bag, or slipper). It was believed that the *domovoy* could move into a new house riding on a cat (FMA, Vologda Region, Omsk Region). A cat or rooster was assigned the same role of the sacrifice, but in a bloodless way, since it was thought that the first one to enter new house would soon die (FMA, Kirov Region, the Altai Territory), and, accordingly, would become the embodiment of the soul of the house, its mythical keeper—the *domovoy*.

As it is known, a culture is not capable of self-organizing, thus the identification of its units is only possible by means of language, which acts in this case, like people say, as "the mirror of culture". For considering the lexicographic description of the unit of *domovoy*, we

should turn to regular dictionaries and dictionaries of linguistic culture, which form the common cultural space and are capable of acting as such a "mirror".

Information about *domovoy* from the dictionary of V.I. Dal is a cultural comment on the entry of "House". It contains a fairly large list of the *domovoy's* names and typical actions: "*domovik*, *dedushka*, *posten*, *lizun*, *domozhil*, *khozyain*, *zhirovik*, *nezhit*…, *susedko*, *batanushka*; the spirit-protector and offender of the house; he bangs and romps at nights, makes mischief, suffocates a sleeping person as a joke; strokes with his shaggy hand for good luck, and so on. He particularly plays tricks in the stables; turns the mane of a favorite horse into a mat of hair…" (Dal, 1880: 466–467). The entry mentions the ambivalent attitude of the *domovoy* toward people, offers a kind of "classification" of *domovoys* according to their habitation areas, and points to their relationship with other home and forest spirits. It is indicated that "one may see a *domovoy* at night on Easter Sunday in the barn; he is shaggy, but you cannot remember anything else besides this feature; he wipes out your memory" (Ibid.: 466).

In other dictionaries, the entries about *domovoy* are minimal in scope and information, "according to popular beliefs, it is a supernatural creature that lives in each house" (Tolkovyi slovar…, 1935: 762); "in the Slavic mythology, a fantastic creature that dwells in the house; the evil or good spirit of the house" (Ozhegov, Shvedova, 1994: 177); "good or evil spirit living, according to superstitious beliefs, in the house" (Efremova, 2000: 217); "according to superstitious beliefs of Slavic and some other peoples, a good or evil spirit living in the house" (Slovar…, 1985: Vol. 1, p. 427). These dictionaries do not provide the description of the *domovoy's* appearance, his typical actions, and attitudes toward people, which causes some surprise since as a home spirit the *domovoy* is the closest and the best known character to people, including urban residents. The dictionaries do not describe situations when people start to remember the *domovoy*, for example, when the owner of the house cannot find a certain thing.

In the linguistic and cultural dictionary, "The Russian Cultural Space" ("Russkoye kulturnoye prostranstvo"), the entries of *domovoy* and *kikimora* are included into the section "precedent names" (Brileva et al., 2004: 187–188, 207–208). This seems a little weird, since they do not possess the main feature of a precedent name ("the existence of the nation-wide invariant of the perception of the phenomenon which the name indicates"; it includes: 1) differential features of the corresponding phenomenon; 2) attributes, that is, all which in people's consciousness is associated with this phenomenon, yet is not necessary, although sufficient, for its signification; 3) evaluation, that is, one of the points on the "good–bad" axis (Ibid.: 26)). In addition, this section of the dictionary predominantly contains the names of fairytale characters and the names of fairytale attributes (for example, *magic wand*, *the golden key*, *the Snow Queen*, and so on). This proximity hinders the perception of the *domovoy* and *kikimora* as mythological, and not fairytale, characters.

The dictionary of linguistic regional geography "Russia" ("Rossiya") has no entries of "Domovoy" and "Kikimora", although according to the authors, the basis for including a certain linguistic entry into the dictionary was the presence of an ethnic and cultural background for the entry ("some set of additional information and associations connected with ethnic history and culture, and known to all Russians" (Rossiya…, 2007: IV)), which means that the entries of *domovoy* and *kikimora*, in our opinion, should have been included in the dictionary.

The beliefs associated with the *domovoy* are still relevant today. They have not lost their importance both among rural and urban residents. Many times we have observed expressions of belief in *domovoys* that were manifested in the setting up "*domovoy* corners" by urban residents in their apartments: they would leave food (bread, milk, or sweets) and toys (a jar with buttons, beads, and other small shiny objects) for the home spirit in some secluded place, or put a broom into the corner (FMA, Novosibirsk, Omsk, Tomsk, Barnaul, St. Petersburg, Novgorod, Pskov, and Kirov). Urban residents would also assign unusual noises in their homes or an unexpected loss of things to the tricks of the *domovoy* (FMA). The survey showed a good awareness of the *domovoy*, which mostly corresponded to the traditional beliefs of the Russian about this home spirit, on the part of urban residents.

Kikimora

According to the materials of ethnography and folklore, the *kikimora* is a mythological character in female guise, living or appearing in the house, in the yard, sometimes in the bathhouse, barn, empty buildings, or taverns (Zelenin, 1995: 60; Maksimov, 1903: 62–69; Cherepanova, 1983: 125). The name *kikimora* could refer to characters or objects, which we divided into four groups: 1) house/yard *kikimora*; 2) forest/bog *kikimora*; 3) a doll made of rags or wood chips (sometimes using blood or objects which were in contact with a dead body) for magical purposes (to induce phantoms in the house, to afflict "harm" on a person); 4) an object (a bottleneck, a rattle of wood chips, etc.) which stove-setters or carpenters, dissatisfied with the payment for their work, might hide in the chimney or in the wall of the house to take revenge on the house owners (the wind would make an unpleasant noise in the house blowing through that object, "howl", frightening house inhabitants). As opposed to the first three groups, the last group was not related to mythological beliefs and magic. In this study, we are primarily interested in the

character of house/yard and forest/bog *kikimoras* (the first and second group).

The home *kikimora* was sometimes considered to be the wife of a *domovoy* (Dal, 2008: 406; Maksimov, 1903: 62–63; Vlasova, 1998: 221), but according to the predominant beliefs they were opposite spirits warring between each other. The *kikimora* appeared as small, ugly, crooked, slovenly woman; an ugly dwarf; dancing doll; girl; woman in white or black clothes, or wearing a red shirt; sometimes people saw her naked; she could turn into a cat, dog, duck, hare, or piglet, but most often she remained invisible (Dal, 2008: 404–421; Zinoviev, 1987: 85–96). Unlike the *domovoy*, the home *kikimora* was endowed with malicious qualities: she would frighten people, rattle, knock, break dishes, spoil bread, tear and entangle handiwork, pluck chickens, or chase horses. Some features of both spirits were the same: they both made noise, stamped, clinked dishes, howled, or cried; could predict the future upon appearing on the eve of important changes in the life of the household; turned into a male or female cat; chased horses, tormented cattle which they did not like; lived in the same places (behind the stove, near the chimney, in the basement, in the attic, in the barn or chicken coop). The permanent feature of the *kikimora* was her connection with spinning: she could finish spinning for the housewife, but would often entangle, tear, soil, or burn fiber which was left for the night without a blessing (Cherepanova, 1983: 124). This feature is reflected in the phraseological body of the Russian language, in proverbs and sayings, such as "Sleep, girl, the kikimora will spin for you", "You will never get a shirt from a kikimora" (Dal, 1881: 107). The concept of the spinning *kikimora*, mostly popular in the Russian North, was also known in Siberia, and is recorded in our field materials, "*I looked inside the bathhouse, and there was a kikimora sitting and beating hemp*" (FMA, Novosibirsk Region). A survey conducted among urban dwellers did not reveal such beliefs.

According to folk beliefs of the Russians, the *kikimora* and *domovoy* had different natures. The former was considered an evil spirit, while the latter was not. The origin of the *kikimora* was often associated with dead unbaptized infants (stillborn or miscarried) (Afanasiev, 1868: 113; Zinoviev, 1987: 85), that is, unlike the *domovoy* (ancestor-spirit), the *kikimora* belonged to the category of "*zalozhnye*" dead people [people who died an unnatural or premature death] (Zelenin, 1995: 51, 60), among whom deceased unbaptized children were the most troublesome and harmful spirits. "*Infants who did not have time to live in the world, especially the unbaptized, would become evil spirits. Their souls are not accepted in the other world. They do harm and scare people. If a kikimora starts to live in the house, there is only annoyance from her; you can't expect any good things because this is an evil spirit, an unbaptized soul*" (FMA, the Altai Territory).

Kikimoras usually appeared at night, but it was also believed that they only appeared at Yuletide (Cherepanova, 1983: 124). One of the elements of Yuletide mummer's play in the Russian North was representation of a *kikimora*, "Old women would come for a gathering at Yuletide dressed up as *shishimoras*—they would put on *shobolki* ['torn clothes' – **O.C.**] and holding a long pointed stick they would sit down on the upper bunk, their legs dangling from the beams, and would spin in this position… Girls would laugh at the *shishimora*, grab her legs, and she would beat them with a stick" (Ibid.: 124–125). According to our field data (recollections of informants corresponding to the 1950s), in a number of places in Western Siberia, people would dress up as *kikimoras* during the Yuletide mummer's play and on Cheesefare Week. Women would wear old clothes ("tatters"), smear their faces with soot, and tousle their hair, creating a slovenly appearance. *Kikimora*-guisers would go caroling with other carnival characters. They carried wool or flax, spindles, and hemp combs; when entering the house, they acted as if they were spinning fiber. "*On the old New Year's Eve, elderly women would go around in rags, with unkempt hair, their faces smeared with soot. They would walk in a crowd around the village, sing bawdy songs, and even sometimes swear. Because of this, they were called kikimoras. On Cheesefare Week, they would dress up as demons, kikimoras. 'Kikimoras' would carry flax in their hands and comb it, would spin threads. Old people said that this needed to be done; good flax would grow because of this*" (FMA, Novosibirsk Region). Thus, the beliefs about the *kikimora* as a home spirit related to handiwork and being capable of influencing the flax harvest, survived in some Siberian villages at least until the mid-20th century.

Let us turn to the dictionary description of the unit of *kikimora*. In the dictionary of Dal, *kikimora* is defined as "a type of *domovoy* that spins at night; during the day, he sits invisible behind the stove, and plays tricks at night with a spindle, spinning wheel, *voroba*, and *viyushka*", but with the clarification that "there is also *lesnaya kikimora* in Siberia". This dictionary entry gives an example of using this unit in speech, "with reproach: homebody, loner, invisible person who always stays at home working, especially someone who spins very diligently. *You will never get a shirt from a kikimora*, although he spins". There is also some practical information in the entry: "So a *kikimora* would not steal the chickens, people would hang the broken neck of a pitcher or a stone with a natural through hole above the roost on bast fiber" (Dal, 1881: 107). We should point to the fact that *kikimora* here was used both in the feminine and masculine forms.

In the "Dictionary of the Russian Language" ("Tolkovyi slovar russkogo yazyka") edited by D.N. Ushakov, the meaning of *kikimora* is given in a somewhat different manner: "1. Evil spirit in

female guise. 2. A person having a ridiculous or funny outlook; ridiculously dressed. 3. A gloomy, unsociable, unpleasant person (colloquial, disapproving). *To strut like a kikimora, not saying a word*" (1935: 1354). The mythological meaning is minimized in the entry, while the possible use in respect to a person is expanded. In the "Dictionary of the Russian Language" by S.I. Ozhegov and N.Y. Shvedova, the entry of *kikimora* includes a list of her possible habitation areas, "small invisible being living behind the stove, in the woods, or in a bog. *Bolotnaya* (bog) and *lesnaya* (forest) *kikimora*". Note that the Dictionary edited by Ushakov recorded the use of the word *kikimora* as abusive and disapproving in relation to a person, whereas in these applications it acquires a humorous tone, of course without losing its negative connotation, "*figurative, masc., and fem*. About a person who has a funny, ridiculous outlook (colloquial, jesting)" (Ozhegov, Shvedova, 1994: 274). The entry "Kikimora" in the "New Dictionary of the Russian Language" ("Novyi slovar russkogo yazyka") by T.F. Efremova (2000: 504) repeats the entry from the Dictionary of Ozhegov and Shvedova with the difference that only "a woman with the funny, ridiculous outlook" can be called a "*kikimora*" (cf. Ozhegov: "*masc*. and *fem*."). In the Small Academic Dictionary ("Maliy academichesky slovar") edited by A.P. Evgenieva, *kikimora* is "according to superstitious beliefs, an evil spirit in the female guise"; the colloquial use of this unit is marked as abusive: "About an ugly or badly dressed woman" (Slovar…, 1985: Vol. 2, p. 48).

The majority of the respondents believed that *kikimora* was the abusive, scornful name of a shaggy, slovenly, unpleasant (both in terms of appearance and behavior, moral qualities) woman. At the same time, many respondents mentioned the features of a *kikimora*, typical of her traditional perception (small facial features, squeaky voice; plucks chickens). Thus, the name and characteristics of this mythological character, which has lost some of its relevance, have been preserved in the Russian language and culture.

Field materials from the turn of the 20th–21st centuries reflect a tendency towards the "transformation" of the *kikimora* from the character of domestic space into a bog spirit. According to our research, most senior informants, the representatives of the older generation, preserved memories about home *kikimoras*. The younger generations (of the 1940–1950s and subsequent years of birth) considered the *kikimora* a forest or bog spirit, sometimes, the wife of *leshiy* (forest spirit) or bog demon, but more often they spoke about the *kikimora* as an independent character—a malicious female spirit that lived in a bog or forest. Urban residents also associated the *kikimora* with the bog and forest (only two respondents called it a harmful home being and the wife of the *domovoy*). We should note that beliefs about forest or bog *kikimoras* were known in the 19th century (Dal, 1881: 107); getting rid of home *kikimora*, people would chase her into the forest (Dal, 2008: 414; Maksimov, 1903: 67–68). Thus, the localization of the *kikimora* outside of the domestic space can be associated with the archetypal perception of this polysemantic character: the evil spirit is expelled outside of the cultural realm.

Possible lexicographic interpretations of the units of *domovoy* and *kikimora*

The above dictionary entries demonstrate the imagery of *kikimora* and *domovoy* (external appearance, typical actions, attitude toward people), as well as the use of the unit of *kikimora* for describing a person. However, according to the type of dictionaries, these entries only represent abbreviated information from specialized mythological dictionaries and do not reflect the contemporary understanding of these characters by native speakers. In this respect, the dictionaries of linguistic culture also do not fully reach the goal relevant for contemporary lexicography: to not only promote the study of language and culture, but also to direct the user of the dictionary to communication.

We consider it useful to offer a lexicographic interpretation from the constructed dictionary of linguistic and cultural literacy, as a new method for recording lexicographic ethnographic information. Every dictionary entry reflects the ordinary meanings most relevant for the native speakers, as well as a set of notions associated with these linguistic units (for more details on this concept and on the development of macro- and microstructure of the dictionary, see (Ansimova, 2014)). An entry consists of the following sections: 1. Header unit; 2. Ordinary meaning, most relevant for the Russians (★); 3. Use in speech (☺); 4. Widespread associations (❇); 5. Minimal reference information (☝); 6. Additional information (✔); 7. Illustration (on the linguistic regional geographic visual clarity, see (Vereshchagin, Kostomarov, 1990: 169–185)). The first five sections are the main ones.

Let us turn to practical lexicography and demonstrate how the units of *domovoy* and *kikimora* can be semanticized in the dictionary of linguistic and cultural literacy. We conducted a questionnaire survey to determine: a) the most relevant ordinary meanings of the offered units, b) the most common associations among the carriers of Russian linguistic culture related to these units, c) those components of the meaning of these units, which are typically used in speech, and d) situational characteristics of their use. Our stated goal defined the specific structure of the questionnaire and the principles of surveying. For characterizing the respondents, we had to define the scope of the survey: 1) persons for whom the language of the questionnaire was the mother tongue; 2) urban residents (for minimizing the impact of dialects);

3) broad geographical coverage of respondents; and 4) students of all fields from universities in Russia at the age of 17–25 as the main part of respondents (Karaulov, 2010: 53).

The survey involved 317 people from different Russian cities: Novosibirsk (37 %), Moscow (22 %), St. Petersburg (17 %), Tomsk (11 %), Omsk (6 %), Barnaul (5 %), Tyumen (1 %), and Salekhard (1 %). The informants included university students from various departments (21 %), representatives of various occupations with higher education (53 %), representatives of different fields of work with specialized secondary education (19 %), and retired citizens (7 %). In the questionnaire, the respondents were asked to answer questions concerning the possible associations, understanding, and use of the units of *domovoy* and *kikimora*. Upon analyzing the responses, we have found which information about these units the native speakers need to know and, thus, which information should be included in the dictionary. Based on ethnographic materials and results of the questionnaire survey, we compiled dictionary entries which reflect the contemporary understanding of *domovoy* and *kikimora* by the Russians.

Domovoy

★ Benevolent home spirit, keeper of the house. He lives behind the stove or in a dark corner. Appears in the form of a small man, small old man or a cat; may be invisible, makes sounds: stomping, knocking, or howling. He is friends with the cat; cats see the *domovoy*. The "keeper" is offered bread, milk, sugar, or sweets; when moving to a new home, he is invited to follow. The *domovoy* likes the home neat, and helps cleanly, hardworking owners. If the home is messy and dirty, and household members quarrel with each other, the *domovoy* becomes angry; he knocks and breaks dishes. "Out of mischief" the *domovoy* can hide a certain thing, but returns it when he has played enough. The rambunctious home spirit can be occupied with toys or "a gift" of several buttons or beads—he likes to go through small shiny objects.

☺ *The domovoy rustled behind the stove*. *The domovoy is howling*. *The domovoy hid it* (said about a thing that cannot be found). *Domovoy, domovoy, play a little and give it back!* (said while searching for a missing item). *Domovoy, calm down my child* (putting to sleep a child who cannot calm down after too much playing). *Wash all corners of your home and the domovoy will like you*.

❇ Home, stove, dark corner, broom, good, helper, hairy little man, bearded old man, soft, fluffy, in the ashes, cat, *domovyonok* ('little domovoy') Kuzya (cartoon character).

☝ In Russian mythology, the keeper of the house. Generic ancestor, the patron of the family and domestic animals; protects the house, people, and cattle from possible misfortunes, thieves, witchcraft, and evil spirits. May appear under a different guise: as a small shaggy man, small white-haired old man, cat, snake, bear, mouse, or weasel, but more often remains invisible; the presence of the *domovoy* is discerned by a sound: he stomps, slams doors, clinks dishes, howls into the chimney, laughs, or cries. He falls on sleeping people and suffocates them. The appearance of the *domovoy* predicts a significant event in the life of the family—birth, marriage, death, fire, or move. He lives behind the stove, in the attic, basement, yard, or in the stable. It was customary to give treats to the *domovoy* so he would be favorable to the dwellers of the house, guard the home, and look after the cattle. When the family moved to a new home, the *domovoy* was invited to move with them so the new home would not remain "empty" and vulnerable to evil spirits. The "keeper" of the home knows the fate of each family member and can predict it; he is addressed during fortunetelling. The *domovoy* is not usually considered an evil spirit.

✔ When a *domovoy* shows himself to a person or falls on a person in sleep, he tries to tell him about significant events in the life of the family forthcoming in the nearest future. One can ask a *domovoy*, "For better or worse?", and the spirit will definitely answer.

✔ When moving to a new home, people invite the *domovoy*. They sweep the corners with a broom, saying, "Keeper of the home, let's go with us to a new home to live". *Domovoy* moves to a new residence in a bag together with a broom or old shoe (slipper). It was also believed that the cat, which would be the first being to enter a new home, could be his "transport".

✔ At Yuletide, girls would tell fortunes about their future bridegrooms. They would guess: if a *domovoy* strokes with a hairy hand, she will marry a rich man; if the *domovoy* strokes with a bare hand, she will marry a poor person; if he pinches, the husband will be quarrelsome and mean.

Kikimora

★ A malicious spirit living in the forest or bog. Fairytale character. The wife of the *domovoy* or *leshiy*. Ugly, slovenly dressed woman. A dirty, scruffy slob. Elderly short woman with small features and squeaky voice. Scary, evil; does bad things to people. The parents would scare children by the *kikimora*, so children would not go into the woods.

☺ *A bog kikimora. Dreadful like a kikimora. Kikimora from overseas* (woman pretentiously dressed, unpleasant, behaving provocatively). *You are a nasty kikimora, that's what you are! Do not go away, the kikimora will carry you away into the woods* (scaring children). *The kikimora will tickle you to death. The kikimora plucked the chickens*.

❇ Bog, quagmire, forest; doing harm to homes, scaring, squeaking, playing dirty tricks; scary, spiteful,

untidy, ugly woman with uncombed hair, with green hair, a girl with heavy makeup.

☝ In Russian mythology, a home personage appearing in the form of a little nimble ugly women or girl, mostly malicious. She lives behind the stove, near the chimney, in the attic, basement, or in the chicken house. She may turn into a cat, dog, piglet, duck, or other animal. At nights, she makes noise, rustles or knocks, frightening the residents of the house. She loves to spin, knit, and crochet, but at the same time she spoils the handiwork and tears the threads left for the night without a blessing. She plucks chickens, chases horses, and shears sheep. The *kikimora* could be "let" into the house by sorcerers or offended builders setting a doll made using magic, in a hidden place. Once the *kikimora* appeared in the house, she would start bothering the residents (it would become frightening to stay in the house; everything would break and get spoiled; people would get sick or even die), and people tried to get rid of her. The origin of the *kikimora* was associated with restless souls of those infants who died unbaptized (or toothless), who customarily were buried under the threshold of the house or in the yard.

Kikimoras could also be of the forest or bog type. Getting rid of home *kikimora*, people would chase her into the woods.

✔ In addition to the mythological character and a doll made by a sorcerer, "*kikimora*" was the name of an object (bottleneck, birch bark rattle) which carpenters or potters, offended by the owners, could set into the wall of the house or into the chimney. This object (*kikimora*) enhanced the sounds of the wind, and it seemed that someone was rustling, howling, or groaning in the house.

✔ Protective charms were used against *kikimoras*, such as juniper, fern, adderstone (a stone with a naturally formed hole, which was also called "one-eyed *kikimora*").

✔ At Yuletide in the Russian North, old women would represent *kikimoras*. They would dress in rags, climb on the stove, and spin, loudly knocking with spinning wheels and spindles. The girls would grab the "*kikimora's*" legs, and she would beat them with a stick. In some Siberian villages, on the eve of the old New Year and on Cheesefare Week, people would walk in costumed processions which included women dressed like *kikimoras*. They acted as if they were pulling flax and spinning wool or flax; they might sing obscene songs.

Conclusions

Upon analyzing the folkloric, ethnographic, and lexicographic sources, we have identified a number of differences in the beliefs about mythological characters of the domestic space current among the urban and rural residents, found some specific regional features, and traced the dynamics in the development of these mythological images. Using the examples of the entries of "*domovoy*" and "*kikimora*", we have proposed a lexicographic interpretation, employed in the constructed dictionary of linguistic and cultural literacy, as a new method for lexicographic recording of ethnographic information.

The results of the empirical studies (FMA of 1999–2015 and the survey of 2015) have shown that in various regions of Russia, the image of *domovoy* was well-known and popular among the respondents of different ages and social groups. The contemporary beliefs about the *domovoy* mostly corresponded to the traditional beliefs of the Russian people. We observed that urban people showed relatively high awareness of this home spirit. The *domovoy* was considered a benevolent helper and protector of home and family; he was perceived as invisible or appearing in the form of a small shaggy (hairy) man, small old man, or cat. The majority of respondents knew the customs of leaving a treat or "toys" for the *domovoy* and inviting him to a new home; many respondents practiced these customs themselves. The appearance of this home spirit was often regarded as a prediction of an important event in the life of the family. According to our field data, in some places, people still preserved the beliefs about the *domovoy* as the soul of the deceased ancestor; the survey among the urban dwellers did not reveal such beliefs.

Unlike the *domovoy*, the image of the *kikimora* has undergone significant changes. For the surveyed urban residents, she was primarily a shaggy ugly woman who could be called "*kikimora bolotnaya*". As a result, the *kikimora* was most often perceived as a forest or bog spirit, not as a home spirit. Rural residents preserved the notion of home *kikimora*, the spinning spirit and a being which was the cause of noise, anxiety, and trouble in the house; women would dress up like *kikimoras* during the Yuletide and Cheesefare Week mummers' plays.

Thus, the mythical characters of the domestic space have not lost their relevance. Beliefs about them are known both to urban and rural residents in different regions of Russia and are one of the components in the traditional culture of the Russians. Therefore, they should be described in a dictionary from the perspective of everyday meanings, most relevant for the native speakers, and the perspective of a set of notions associated with these linguistic units.

References

Afanasiev A.N. 1865–1868

Poeticheskiye vozzreniya slavyan na prirodu: Opyt sravnitelnogo izucheniya slavyanskikh predaniy i verovaniy v svyazi s mificheskimi skazaniyami drugikh rodstvennykh narodov. Vol. I, II. Moscow: Izd. K. Soldatenkova.

Ansimova O.K. 2014
Lingvokultura i ee otrazheniye v slovaryakh. Novosibirsk: Izd. Novosib. Gos. Tekhn. Univ.

Balov A. 1891
Sledy drevnikh verovaniy v narodnom ikonopochitanii. *Zhivaya starina*, iss. III: 218–222.

Brileva I.S., Volskaya N.P., Gudkov D.B., Zakharenko I.V., Krasnykh V.V. 2004
Russkoye kulturnoye prostranstvo: Lingvokulturologicheskiy slovar. Moscow: Gnozis.

Cherepanova O.A. 1983
Mifologicheskaya leksika Russkogo Severa. Leningrad: Leningr. Gos. Univ.

Dal V.I. 1880–1881
Tolkovyi slovar zhivogo velikorusskogo yazyka. In 4 vols. Vol. I, II. Moscow, St. Petersburg: Izd. M.O. Volfa.

Dal V.I. 2008
Poverya, sueveriya i predrassudki russkogo naroda. Moscow: Eksmo.

Efremova T.F. 2000
Novyi slovar russkogo yazyka: Tolkovo-slovoobrazovatelnyi. Moscow: Drofa, Russkiy yazyk.

Golubkova O.V. 2009
Dusha i priroda: Etnokulturnye traditsii slavyan i finno-ugrov. Novosibirsk: Izd. IAE SO RAN.

Hirsch E.D., Jr. 1988
Cultural Literacy: What Every American Needs to Know. New York: Random House.

Karaulov Y.N. 2010
Russkiy yazyk i yazykovaya lichnost. Moscow: LKI.

Krinichnaya N.A. 2004
Russkaya mifologiya: Mir obrazov folklora. Moscow: Akademicheskiy proekt; Gaudeamus.

Levkievskaya E.E. 2000
Mify russkogo naroda. Moscow: Astrel.

Maksimov S.V. 1903
Nechistaya, nevedomaya i krestnaya sila. St. Petersburg: Tovarishchestvo R. Golike i A. Vilborg.

Ozhegov S.I., Shvedova N.Y. 1994
Tolkovyi slovar russkogo yazyka. Moscow: Az.

Pomerantseva E.V. 1975
Mifologicheskiye personazhi v russkom folklore. Moscow: Nauka.

Rossiya: Bolshoy lingvostranovedcheskiy slovar. 2007
Y.E. Prokhorov (ed.). Moscow: AST-PRESS Kniga.

Slovar russkogo yazyka. 1985
In 4 vols. A.P. Evgenyeva (ed.). Vol. 1, 2. Moscow: Russkiy yazyk.

Tolkovyi slovar russkogo yazyka. 1935
In 2 vols. D.N. Ushakov (ed.). Vol. 1. Moscow: OGIZ.

Vereshchagin E.M., Kostomarov V.G. 1990
Yazyk i kultura: Lingvostranovedeniye v prepodavanii russkogo yazyka kak inostrannogo. Moscow: Russkiy yazyk.

Vinogradova L.N. 2000
Narodnaya demonologiya i miforitualnaya traditsiya slavyan. Moscow: Indrik.

Vlasova M.N. 1998
Russkiye sueveriya: Entsiklopedicheskiy slovar. St. Petersburg: Azbuka.

Zelenin D.K. 1995
Ocherki russkoi mifologii: Umershiye neyestestvennoi smertyu i rusalki. Moscow: Indrik.

Zinoviev V.P. 1987
Mifologicheskiye rasskazy russkogo naseleniya Vostochnoy Sibiri. Novosibirsk: Nauka.

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Dental Anthropology of the Mesolithic and Neolithic Populations of the Eastern European Forest-Steppe Zone*

Dental data are used to test two hypotheses as to whether the "eastern" traits of the Mesolithic and Neolithic populations of the Russian Plain are due to Mongoloid admixture or to evolutionary conservatism: specifically, to the retention of features peculiar to the Upper Paleolithic groups. Frequencies of nonmetric traits (both those used in standard population studies and so-called markers of generalized conservatism) were studied in dental samples from Yuzhny Oleniy Ostrov and Vasilyevka-3 (Mesolithic), Fomino (Ryazan variant of Pit-Comb Ware culture), Karavaikha (Kargopol variant of the same culture), Vovnigi-1 (Kiev-Cherkassy variant of the Neolithic Dnieper-Donets culture), and Vovnigi-2 (Azov-Dnieper variant of the same culture). Published dental data on Zvejnieki (Mesolithic Kunda culture), Yasinovatka and Nikolskoye (Dnieper-Donets culture), Sakhtysh-2a (Lyalovo variant of the Neolithic Pit-Comb Ware culture), and Upper Paleolithic samples from Europe were used for comparison. Both A.A. Zubov's standard protocol and C.G. Turner's ASUDAS were employed. The results suggest that multiple evolutionary processes were involved. Northeastern European Mesolithic dentitions indicate both Mongoloid admixture and continuity with Upper Paleolithic groups. Mesolithic series from Ukraine are more specialized in the Caucasoid direction, while also showing certain Upper Paleolithic traits. In the Neolithic, the dental differences between northern and southern Caucasoids decrease, and there is a gradual reduction of both Mongoloid and Upper Paleolithic characteristics. Nonetheless, people of the Pit-Comb Ware culture, like those of Dnieper-Donets culture display certain Upper Paleolithic traits, which are the most evident in Vovnigi-2.

Keywords: *Upper Paleolithic, Mesolithic, Neolithic, dental anthropology, evolutionary conservatism.*

Introduction

The population history of the Mesolithic and Neolithic groups of the Russian Plain is one of the most hotly debated topics in Russian physical anthropology. There are two main views on the topic. The first view explains the cranial morphology of the Mesolithic and Neolithic population as a result of an admixture between European Caucasoid and East Asian or Siberian (Mongoloid) groups (Benevolenskaya, 1984; Denisova, 1997; Zhirov, 1940). The second view considers the craniological type of the population as "evolutionarily conservative" or "undifferentiated" and retaining ancient Upper Paleolithic morphology (Gokhman, 1986: 219; Yakimov, 1958: 90). The first view has been prevalent in the anthropological literature for a long time. But at the moment, the most popular paradigm considers both Caucasoids and Mongoloids as descendants of "boreal Eurasians", and thus the cranial morphology of the Neolithic population is interpreted as "undifferentiated" with respect to modern races' morphology, or "evolutionarily conservative" (Chikisheva, 2012: 179).

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However, there are some trends in recent scientific literature reviving this long-standing debate about the population history of the forest belt of the Russian Plain. Firstly, there is a growing tendency in the literature to use the terms "undifferentiated" and "evolutionarily conservative" as synonyms, despite substantial differences between the two. The first term can be used in the broad sense and applied to any group that morphologically does not fit well in the modern racial classification. By contrast, "evolutionary conservatism" necessarily means retention of a complex of traits typical of the group ancestral to both descendant populations: those populations relative to which a group can be called "evolutionarily conservative". The importance of correct use of both terms is particularly evident when discussing the Mesolithic and Neolithic population of the Russian Plain. In this case, the morphology of a skeletal sample can be considered "undifferentiated" even if it emerged as a result of an ancient admixture between populations that were not descended from a recent common ancestor. Such a situation can occur, for instance, if there were "Protomongoloids" among the ancestors of a group, as the morphology of "Protomongoloids" differs substantially from that of modern Mongoloid populations. But to call an ancient population "evolutionarily conservative", a researcher should convincingly demonstrate the persistence of some morphological traits typical of the Mesolithic and Neolithic groups—descendants of the Upper Paleolithic Europeans.

Secondly, according to the results of recent population genetic studies, subclades of the mtDNA haplogroup C were widely dispersed throughout the Russian Plain during Mesolithic and Neolithic times. Those haplogroups are found in at least three archaeological samples: the Mesolithic Yuzhny Oleniy Ostrov at Lake Onega (Der Sarkissian et al., 2013), and the Neolithic Nikolskoye and Yasinovatka sites (Newton, 2011: Tab. 4) in the Dnieper River region. The haplogroup C is considered a typical Eastern Eurasian haplogroup, found with highest frequencies in Central and Southern Siberian populations (Balanovskaya, Balanovsky, 2007: 142). As it has never (so far) been found in the Upper Paleolithic specimens from Eastern Europe, a migration from the East becomes a plausible explanation of its appearance in the Mesolithic and Neolithic groups.

Methods

In this study, the two following hypotheses were examined: that there was a gene-flow from Eastern Eurasian Mongoloid groups to the Mesolithic and Neolithic population of the forest belt of the Russian Plain; and that there was an "evolutionarily conservative" component in the gene pool of this population, arising from the Upper Paleolithic population. In order to test the hypotheses we aimed, firstly, to trace the chronological dynamics of the frequencies of the dental traits marking Mongoloid dental complex; and, secondly, to assess to what extent the studied samples are similar to the Upper Paleolithic population of Europe. The Mongoloid dental complex traditionally includes the following traits: shoveling of the upper central incisors, the distal trigonid crest, and six-cusped lower first molars. These traits are a part of the conventional set of traits used in Russian dental anthropology for inter-population comparisons. The set also includes frequencies of four-cusped lower first and second molars, deflecting wrinkles on the lower first molars, hypocone reduction on the maxillary second molars, and odontoglyphic variant 2med(II) (the distal groove of metaconid falls into the fissure separating the metaconid and the protoconid) (Zubov, 1968, 2006).

Another set of traits was designed specifically for assessing the degree of "evolutionary conservatism" of the dental complex of a sample and its probable similarity to Upper Paleolithic morphology (Zubova, 2013). The set includes phenes that are typical of the Upper Paleolithic samples but rare in modern populations. The pattern of variation of these phenes in modern Eurasians is "mosaic", and thus one of them taken alone does not have a great taxonomic value. But in the Upper Paleolithic, these traits assemble in different localities to form unique dental complexes, and those complexes could be of great importance when studying inter-population continuity.

In our study, the set of traits marking "evolutionary conservatism" includes: labial convexity, lingual fovea, finger-like projections, and the lingual inclination of the upper incisors crowns; distal and mesial accessory ridges of upper and lower canines; rhomboid crown shape, crista oblique, metaconulus, and the odontoglyphic variant 1Pr(II) (the distal protocone groove falls into the fissure separating the protocone and paracone); anterior and posterior fovea of the upper and lower molars; shoveling of the lower incisors; accessory cusps of the lower premolars; derivatives of cingulum on the premolars and molars; and middle trigonid crest of lower molars. Grade scales for all traits in Russian dental system and ASUDAS are shown in Table 1.

Material*

Our dental sample included the following collections representing the Mesolithic and Neolithic sites of the

*The author expresses her gratitude to the skeletal collection curators at the Peter the Great Museum of Anthropology and Ethnography (MAE) RAS (St. Petersburg) and Anuchin Research Institute and Museum of Anthropology of MSU (Moscow) for access to material.

Table 1. **Dental traits used in this study, and their grade scales**

Trait	Key teeth	A.A. Zubov's dental system	Archaic features accounting	ASUDAS	Source (trait and scale description)
			Maxilla		
Shoveling	I^1	2–3	–	2–7	(Zubov, 1968, 2006; Turner, Nichol, Scott, 1991)
Labial convexity	I^1	–	2–4	2–4	(Turner, Nichol, Scott, 1991)
Lingual fovea	I^1	–	+	–	(Zubova, 2013)
Finger-like projections	I^1, C	+	1–3	+	(Zubov, 1968; Zubova, 2013)
Lingual inclination of the crown	I^1	–	+	–	(Zubova, 2013)
Hypocone reduction	M^2	3, 3+	–	0–3	(Zubov, 1968; Turner, Nichol, Scott, 1991)
Carabelli cusp	M^1	2–5	–	2–7	(Zubov, 1968, 2006; Turner, Nichol, Scott, 1991)
Rhomboid crown shape	M^1	–	+	–	(Bailey, 2004)
Crista oblique	M^1	+	3	+	(Zubov, 1968; Zubova, 2013)
Metaconulus	M^1	+	+	–	(Zubov, Khaldeyeva, 1993)
1Pr(II)	M^1	+	+	–	(Zubov, 1974)
Anterior fovea	M^1	+	+	+	(Scott, Turner, 1997)
Posterior fovea	M^1	+	+	+	(Ibid.)
			Mandible		
Mesial accessory ridge	C	+	2–3	2–3	(Zubov, Khaldeeva, 1993; Turner, Nichol, Scott, 1991)
Distal accessory ridge	C	1–5	1–5	1–5	(Scott, 1977)
Crown asymmetry	P_1, P_2	+	+	+	(Bailey, 2002)
Additional mesial lingual cusps	P_1, P_2	–	+	–	–
Additional distal lingual cusps	P_1, P_2	–	+	–	–
Cingulum	M_1	–	+	–	(Zubov, 1960)
Hypoconulid	M_1	$5M_1 + 6M_1$	–	1–5	(Zubov, 1968; Turner, Nichol, Scott, 1991)
Four-cusped M_2	M_2	+	–	+	(Ibid.)
Six-cusped M_1	M_1	+	–	+	"
Distal trigonid crest	M_1	+	–	+	"
Middle trigonid crest	M_1	+	+	+	(Zubov, 1992)
Deflecting wrinkle	M_1	+	–	2–3	(Zubov, 1968; Turner, Nichol, Scott, 1991)
Anterior fovea	M_1	+	+	+	(Turner, Nichol, Scott, 1991)
Posterior fovea	M_1	+	+	+	–
Central cusp	M_1	–	+	–	(Khaldeyeva, Kharlamova, Zubov, 2010)
2med(II)	M_1	+	–	–	(Zubov, 2006)
2med(III)	M_1	+	–	–	(Ibid.)
1med/1prd	M_1	1, 2, 3	–	–	"

Russian Plain: Mesolithic from Yuzhny Oleniy Ostrov in Karelia (Onega culture, 7th–6th millennia BC, MAE RAN collection No. 5773) and Vasilyevka-3 in the Dnieper River region (MAE RAN collection No. 6462); Neolithic from Chernaya Gora (Fomino) burial grounds, Ryazan variant of the Pit-Comb Ware culture (4th–3rd millennia BC (Arkheologiya…, 1996: 378) (MSU collection No. 89: No. 2–6, 10, 13, 14, 16–18); Karavaikha, Kargopol variant of the same culture (4th–mid 3rd millennia BC (Ibid.) (MSU collection No. 8622–8625, 8761, 9788); and Vovnigi-1 (Kiev-Cherkassy variant of the Neolithic Dnieper-Donets culture), and Vovnigi-2 (Azov-Dnieper variant of the same culture) (MAE collection No. 6204; MSU collection unnumb.). All these samples were studied using both the conventional set of dental traits and the "evolutionary conservatism" set of traits (Table 2).

Additional reference data were a Mesolithic sample from Zvejnieki (Mesolithic Kunda culture, Latvia), two Neolithic samples of Dnieper-Donets culture from Dnieper Nadporozhye region (Yasinovatka, Nikolskoye), and a sample from Sakhtysh-2a (Lyalovo variant of the Neolithic Pit-Comb Ware culture). These samples were studied using only the conventional set of traits (Table 2), and were used mostly to examine the possible Mongoloid admixture in the Neolithic population of Eastern Europe.

Frequencies of dental traits in a combined sample of the Upper Paleolithic specimens from Kostenki XIV, XV, XVIII and Sungir 2, 3 (Table 3) were used as a "reference" dental complex in respect of which the chronological dynamics of the traits frequencies have been assessed. A description of the Kostenki XVIII dentition was published by N.I. Khaldeyeva (2006), Sungir, by A.A. Zubov (2000), and the specimens from Kostenki XIV (MAE, No. 6463-1) and XV (MAE, No. 6109-1) were examined by the author. Finally, published data on the Early and Late Upper Paleolithic European population (Manni, Vargiu, Coppa, 2007) were also used in this study (Table 3).

Results and discussion

Upper Paleolithic data. As mentioned in our previous publications, the specimens from the forests-steppe zone of the Russian Plain all represent the same dental complex. Typical of this complex are the absence of marked shoveling of the upper medial central; elevated occurrence of Carabelli cusp and distal accessory cusps of the upper first molars; considerable reduction of hypocone on the upper second molars; and the absence of six-cusped lower molars, *tami*, and distal trigonid crest in the lower first molars. Other distinctive features are a predominance of Y-pattern on the lower first molars and a rather high occurrence of four-cusped lower second molars (Zubova, Chikisheva, 2015: 143). This combination of traits is generally similar between our and other researchers' data (Table 3); but it is of note that, owing to differences between research protocols, our data are not fully comparable with those of the Western and Central European studies. The main difference between the Russian (Sungir and Kostenki) and European specimens is the absence of the six-cusped lower first molars, of distal accessory ridges on upper and lower canines, of shoveling of the lower incisors, and of epicristid in lower molars in the Russian specimens (Table 3).

According to existing data, there are two different dental variants in the Paleolithic population of the forest-steppe zone of the Russian Plain: one is represented at the Sungir site, and another in the Kostenki-Borshchevo archaeological records. The Sungir variant is characterized by a greater robustness of the dentition, and also the presence of deflecting wrinkles on the lower first molars (Ibid.); while the Kostenki complex is characterized by a marked gracility of the dentition. A set of "evolutionarily conservative" traits shared by most Upper Paleolithic fossils includes labial convexity of the vestibular surface of medial incisors; lingual inclination of their crowns; and complete posterior foveae or their elements on upper first molars. The Kostenki XVIII individual also showed posterior foveae on lower molars. In the Kostenki XIV fossil, a peculiar morphology of lower premolars, different from both Neanderthal and modern dentition, was observed. The Sungir specimens exhibit a hypertrophy of hypocone, finger-like projections of upper incisors and canines, a complex ("Neanderthaloid") shape of lower premolar, cingulum of lower molars and central cusp, and type 3 of the first eocone (paracone) groove, often considered a marker of the Eastern dental meta-race (Zubov, 2006: 50). Notably, the distribution of other odontoglyphic phenes, typically used for distinguishing between populations of the Eastern and Western dental meta-races, is different in the Upper Paleolithic specimens as compared to modern population. The relationship between the confluence points of the first metacone and eocone (protocone) grooves on the upper first molars is represented by variants 2 and 3; type 1, most common in Caucasoids, is absent here (Ibid.: 56). The same situation is observed for the distribution of variants of the confluence of the second metaconid fissure on lower first molars. In both cases, when its direction could be reliably traced (Sungir 2 and Kostenki XV), it fell into the intertubercular fissure III, thus showing the absence of 2med(II) phene, typical of Caucasoid populations. The first grooves of metaconid and protoconid in these specimens join fissure II together, forming a neutral combination from the point of view of racial differentiation.

Table 2. **Dental trait frequencies in the Mesolithic and Neolithic samples**

Trait	Yuzhny Oleniy Ostrov		Zvejnieki*		Fomino		Karavaikha		Sakhtysh-2a		Vasilyevka-3		Vovnigi-1		Vovnigi-2		Yasinovatka**		Nikolskoye**	
	n (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Maxilla																				
Shoveling	...	12*	...	26.7	0 (7)	0	0 (3)	0	0 (7)	0	0 (5)	0	0 (2)	0	1 (14)	7.14	0 (12)	0	0 (2)	0
Labial convexity	1 (7)	14.3	...	...	0 (4)	0	1 (3)	33.3	...	...	0 (5)	0	0 (2)	0	0 (21)	0	...	...	...	...
Lingual fovea	0 (9)	0	...	...	0 (4)	0	0 (3)	0	...	...	0 (5)	0	0 (1)	0	0 (20)	0	...	...	...	...
Lingual inclination of the crown	0 (5)	0	...	...	0 (4)	0	0 (3)	0	...	...	0 (5)	0	0 (2)	0	0 (21)	0	...	...	...	...
Finger-like projections I1	2 (7)	28.6	...	...	1 (4)	25	0 (3)	0	...	...	1 (5)	20	0 (1)	0	3 (19)	15.79	...	...	...	...
Finger-like projections C	0 (9)	0	...	...	1 (4)	25	0 (4)	0	...	...	0 (5)	0	0 (1)	0	3 (21)	14.3	...	...	...	...
Distal accessory ridge	0 (9)	0	...	...	0 (4)	0	0 (4)	0	...	...	2 (5)	40	0 (2)	0	4 (21)	19.05	...	...	...	...
Mesial accessory ridge	0 (9)	0	...	...	0 (4)	0	0 (4)	0	...	...	0 (5)	0	0 (2)	0	0 (21)	0	...	...	...	...
Rhomboid crown shape	1 (24)	4.2	...	...	0 (8)	0	0 (4)	0	...	...	0 (8)	0	0 (11)	0	3 (42)	7.1	...	...	...	...
Carabelli cusp	...	30.8*	...	64.7	6 (8)	75	1 (4)	25	4 (12)	33.3	1 (7)	14.3	2 (8)	25	8 (21)	38.1	8 (23)	34.8	3 (15)	20
Crista oblique	0 (9)	0	...	...	2 (6)	33.3	1 (4)	25	...	...	0 (4)	0	0 (5)	0	2 (16)	12.5	...	...	...	...
Metaconulus	0 (2)	0	...	...	1 (6)	16.7	0 (4)	0	...	...	0 (2)	0	0 (6)	0	0 (12)	0	...	...	...	...
Anterior fovea	0 (6)	0	...	...	0 (6)	0	0 (4)	0	...	...	0 (2)	0	0 (3)	0	0 (20)	0	...	...	...	...
Posterior fovea	0 (7)	0	...	...	0 (6)	0	0 (3)	0	...	...	0 (5)	0	0 (4)	0	1 (22)	4.54	...	...	...	...
1Pr(II)	...	...	...	...	2 (3)	66.7	…	...	...	...	...	...	0 (3)	0	0 (3)	0	...	...	...	...
Hypocone reduction	...	26.2*	...	18.2	3 (11)	27.3	4 (5)	80	3 (8)	37.5	6 (9)	66.7	3 (13)	23	15 (27)	55.56	2 (19)	10.5	2 (14)	14.3

Table 2 (end)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Mandible																				
Shoveling	0 (13)	0	...	...	0 (3)	0	0 (3)	0	...	...	0 (7)	0	0 (3)	0	0 (22)	0	...	...	...	...
Distal accessory ridge	0 (12)	0	...	...	0 (5)	0	0 (4)	0	...	...	1 (10)	10	0 (6)	0	0 (23)	0	...	...	...	...
Mesial accessory ridge	0 (12)	0	...	...	0 (5)	0	0 (4)	0	...	...	0 (10)	0	0 (6)	0	0 (23)	0	...	...	...	...
Mesial accessory cusps P1	0 (20)	0	...	...	0 (4)	0	0 (4)	0	...	...	0 (8)	0	0 (8)	0	1 (26)	3.84	...	...	...	...
Distal accessory cusps P1	0 (20)	0	...	...	0 (4)	0	0 (4)	0	...	...	0 (8)	0	0 (8)	0	0 (26)	0	...	...	...	...
Cingulum M1	0 (29)	0	...	...	0 (8)	0	0 (4)	0	...	...	0 (12)	0	0 (12)	0	0 (35)	0	...	...	...	...
Six-cusped M1	...	12.5*	...	11.5	1 (7)	14.3	0 (4)	0	3 (13)	27	1 (12)	8.33	0 (9)	0	0 (23)	0	2 (22)	9.1	1 (11)	9.1
Four-cusped M1	...	3.5*	...	0	0 (7)	0	0 (4)	0	0 (13)	0	0 (12)	0	0 (12)	0	0 (24)	0	0 (22)	0	0 (11)	0
Distal trigonid crest	...	10.9*	...	0	2 (8)	25	0 (4)	0	2 (11)	18.18	0 (6)	0	0 (9)	0	0 (16)	0	0 (14)	0	0 (10)	0
Epicristid	0 (19)	0	...	...	0 (7)	0	0 (3)	0	0 (11)	0	0 (6)	0	0 (9)	0	0 (35)	0	...	...	...	...
Deflecting wrinkle	...	15.4*	...	10.6	1 (5)	20	0 (4)	0	1 (5)	20	0 (2)	0	0 (4)	0	0 (6)	0	0 (6)	0	0 (6)	0
Anterior fovea	0 (8)	0	...	...	0 (6)	0	0 (2)	0	...	...	0 (5)	0	0 (5)	0	0 (21)	0	...	...	...	...
Posterior fovea	0 (14)	0	...	...	0 (6)	0	0 (3)	0	...	...	0 (5)	0	0 (5)	0	0 (25)	0	...	...	...	...
Central cusp	0 (7)	0	...	...	0 (7)	0	0 (3)	0	...	...	0 (6)	0	0 (8)	0	1 (28)	3.57	...	...	...	...
1med/1prd1	0 (1)	0	...	...	0 (1)	0	0 (2)	0	...	...	2 (2)	100	0 (1)	0	0 (3)	0	...	...	...	...
1med/1prd2	1 (1)	100	...	...	1 (1)	100	2 (2)	100	...	...	0 (2)	0	0 (1)	0	3 (3)	100	...	...	...	...
1med/1prd3	0 (1)	0	...	...	0 (1)	0	0 (2)	0	...	...	0 (2)	0	1 (1)	100	0 (3)	0	...	...	...	...
2med(II)	1 (4)	25	...	...	2 (5)	40	1 (2)	50	...	...	1 (2)	50	...	...	1 (6)	16.7	0 (7)	0	1 (6)	16.7
2med(III)	2 (4)	50	...	...	3 (5)	60	0 (2)	0	...	...	1 (2)	50	...	...	0 (6)	0	6 (7)	85.7	3 (6)	50
Four-cusped M2	...	55.5*	...	80.8	5 (8)	62.5	4 (4)	100	...	...	8 (11)	72.72	8 (9)	88.88	19 (24)	79.17	20 (23)	86.9	12 (15)	80

* Data after (Denisova, Graudonis, Gravere, 1985).

** Data after (Segeda, 2013).

Table 3. **Dental trait frequencies in the Upper Paleolithic European specimens**

Trait	Kostenki and Sungir		Early Upper Paleolithic Europe		Late Upper Paleolithic Europe	
	n (*N*)	%	*n* (*N*)	%	*n* (*N*)	%
Maxilla						
Shoveling	0 (4)	0	1 (20)	5	0 (19)	0
Labial convexity	2 (4)	50	10 (23)	43.5	8 (19)	42.1
Lingual fovea	0 (3)	0	...	...	...	...
Lingual inclination of the crown	2 (4)	50	...	...	...	...
Finger-like projections I1	1 (3)	33.3	…	31.2	6 (16)	37.5
Finger-like projections C	1 (3)	33.3	9 (10)	90	14 (24)	58.3
Distal accessory ridge	0 (3)	0	2 (5)	40	10 (20)	50
Mesial accessory ridge	0 (3)	0	0 (7)	0	0 (22)	0
Rhomboid crown shape	1 (5)	20	...	...	...	...
Carabelli cusp	2 (5)	40	9 (21)	42.9	21 (37)	56.8
Crista oblique	0 (4)	0	...	...	...	...
Metaconulus	0 (4)	0	...	...	...	...
Anterior fovea	0 (4)	0	...	...	...	...
Posterior fovea	2 (4)	50	...	...	...	...
1Pr(II)	0 (2)	0	...	...	...	...
Hypocone reduction	2 (4)	50	…	40	15 (45)	33.3
Mandible						
Shoveling	0 (3)	0	…	9.1	0 (31)	0
Distal accessory ridge	0 (3)	0	8 (15)	53.3	8 (26)	30.8
Mesial accessory ridge	0 (3)	0	...	...	...	...
Mesial accessory cusps P1	0 (2)	0	...	...	...	...
Distal accessory cusps P1	0 (2)	0	...	...	...	...
Cingulum M1	1 (4)	25	...	...	...	...
Six-cusped M1	0 (5)	0	…	6.1	3 (44)	6.8
Four-cusped M1	1 (5)	20	...	...	...	...
Distal trigonid crest	0 (4)	0	...	...	...	...
Epicristid	0 (4)	0	4 (17)	23.5	7 (22)	31.8
Deflecting wrinkle	1 (4)	25	1 (2)	50	2 (13)	15.4
Anterior fovea	0 (4)	0	...	...	6 (12)	50
Posterior fovea	1 (5)	20	...	...	...	...
Central cusp	1 (3)	33.3	...	...	...	...
1med/1prd1	1 (2)	50	...	...	...	...
1med/1prd2	0 (2)	0	...	...	...	...
1med/1prd3	1 (2)	50	...	...	...	...
2med(II)	0 (2)	0	...	...	...	...
2med(III)	2 (2)	100	...	...	...	...
Four-cusped M2	4 (4)	100	30 (37)	81.1	40 (49)	81.6

Mesolithic data. The Mesolithic samples from Yuzhny Oleniy Ostrov and Vasilyevka-3 differ substantially. The former retains the elevated occurrence of Carabelli cusp, deflecting wrinkle, and a prevalence of the five-cusped lower first molars: a combination typical of the Upper Paleolithic groups. The distribution of odontoglyphic phenes can be described only in very general terms, because of strong dental attrition. Phene 2med(II) is present in the sample, but occurs more rarely as compared to 2med(III). The relationship between confluence points of the first metaconid and protoconid grooves with the intertubercular fissure is only represented by variant 1, as in the Paleolithic. At the same time, the full trait complex marking the Eastern dental meta-race is present in the sample, though most traits are found with low frequencies: marked shoveling of upper incisors, sixth cusp on lower first molars, prevalence of the five-cusped lower second molars, and the distal trigonid crest (see Table 2). Nevertheless, the maxillary complex of the sample retains many of the "evolutionarily conservative" traits commonly found in the Upper Paleolithic skulls: labial convexity of medial incisors, posterior fovea of the upper molars, and finger-like projections of the upper incisors and canines. There was also a case of the rhomboid upper molar in the sample, similar to the Sungir 2 specimen.

But the Vasilyevka-3 sample displays a morphology which is much closer to that of typical Caucasoid groups. The two most important "Mongoloid" traits—the upper incisors' shoveling and the distal trigonid crest—are absent in the sample; the six-cusped lower molars are less frequent, while the four-cusped lower second molars are more frequent. The "evolutionary conservatism" traits are much less common in this sample. From the whole set of "conservative" traits, there were observed only finger-like projections in the upper incisors and canines (Table 2). 2med (II) and 2med(III) variants were found just one time each.

The Mesolithic Zvejnieki sample is intermediate between the two above-mentioned samples in terms of the prevalence of the traits of the conventional set. The Eastern dental meta-race markers in the sample are represented by the upper incisors' shoveling and six-cusped lower molars, while the distal trigonid crest is absent (Table 2).

Neolithic data. In the sample from Fomino (Ryazan variant of the Pit-Comb Ware culture), the following markers of the Eastern dental meta-race were observed: the six-cusped lower first molars, distal trigonid crest, and increased frequency of the five-cusped lower second molars; while the medial incisor shoveling was absent (Table 2). There were several cases of weakly pronounced marginal ridges of the lingual surface of the incisors, but they never reached grade 2 of the standard scale. Gracile types of the lower first molars are absent in the sample, while the deflecting wrinkle of metaconid and the elevated occurrence of the Carabelli cusp are present. Such a combination is also observed in the Mesolithic population of the Baltic region. The "evolutionary conservatism" markers are virtually absent in Ryazan sample (just one case of the mesostylid in the lower second molar). Turning to the odontoglyphic phenes, there were two cases of the distal groove of protocone merging with the fissure II, variant 2 of the relationship between confluence points of 1med and 1prd, and an increased frequency of the "Eastern" variant 2med(III) as compared to 2med(II).

At Karavaikha (Kargopol variant of the Pit-Comb Ware culture), there were no "Eastern" markers found in the sample, while the "evolutionary conservatism" set was represented only by labial convexity of upper incisors (see Table 2); the Carabelli trait frequency is increased, the deflecting wrinkle is absent. Odontoglyphic phene 2med (II) is present, 2med(III) is absent. The relationship between confluence points of the first metaconid and protoconid grooves could be recorded in only one case, when 1med merged with the intertubercular fissure lower than 1prd. The Sakhtysh-2a sample (Lyalovo variant of the same culture) is similar to the Karavaikha in terms of the prevalence of traits of the conventional set: the upper medial incisors' shoveling is also absent, but the frequency of the six-cusped lower first molars is increased; whereas the frequency of the four-cusped second molars is decreased. The distal trigonid crest and deflecting wrinkle of the metaconid are also present.

In the Neolithic samples from the Ukraine, the markers of the Eastern dental meta-race are virtually absent, despite their earlier dates as compared to the Northern Neolithic samples. The samples of the Dnieper-Donets culture (Yasinovatka, Nikolskoye, Vovnigi-1) are very similar to the Mesolithic sample from Vasilyevka-3. The dental complex, common to all these groups, includes absence of the upper incisors' shoveling, four-cusped lower first molars, distal trigonid crest, and the deflecting wrinkle; a moderate frequency of the Carabelli cusp, and low reduction level of the maxillary molars (Table 2). Of the "Eastern" markers, there are only six-cusped lower molars found in the sample with a very moderate frequency, which in fact fits to the modern Caucasoid range of this trait (Table 2). In the only sample examined for the "evolutionary conservatism" markers (Vovnigi-1), they were not found in the key teeth at all.

The Vovnigi-2 samples display a slightly different dental complex as compared to other Ukrainian groups. First of all, a case of marked shoveling of the upper incisors was observed; but more importantly, the morphology of the dentition was much more "evolutionarily conservative". In this sample were observed the finger-like projections

of upper incisors and canines, the distal accessory ridge of upper canines, posterior fovea on upper first molars, and several cases of the hypocone hypertrophy. In the lower premolars, a mesial accessory cusp was found, and in the lower molars, a central accessory cusp. Such a dental complex makes the Vovnigi-2 sample similar to the Upper Paleolithic groups of Europe.

Our results led us to conclusion that both main views on the formation of distinctive dental morphology of the Mesolithic and Neolithic population in the Russian Plain were valid and well-based. But the history of this population as reconstructed from the dental non-metrics variation is slightly different from the results of craniometric studies.

Our results for the Mesolithic Yuzhny Oleniy Ostrov sample (Onega culture) help to resolve the contradiction between the two opposite points of view: E.V. Zhirov's (1940), G.F. Debets' (1956), Y.D. Benevolenskaya's (1984), and R.Y. Denisova (1997) on the one hand, and V.P. Yakimov's (1958) on the other hand. One can see a persistence of the "evolutionarily conservative" dental complex, similar to the Upper Paleolithic morphology. Most of the "evolutionary conservatism" markers, found in the ancient European specimens, are present in the sample. But at the same time, as was suggested by the previous studies, the presence of the Eastern dental meta-race markers shows that another dental complex, brought in by ancient Mongoloid migrants, was also present in the sample (Zubova, 2012). The dental complex of the Vasilyevka-3 sample is more specialized. Both "evolutionarily conservative" and Mongoloid complexes are reduced, and the frequencies of most phenes fit into the range of variation of the modern Central European dental type.

The trends of dental variation found in the Mesolithic age continue in the Neolithic samples. Neolithic populations can be divided into two groups, according to their cultural and chronological attribution. The first group includes the population of the forest belt (Pit-Comb Ware culture), while the second includes representatives of the Dnieper-Donets culture.

In most Northern groups, some markers of the Eastern dental meta-race are still found, but correlations between single traits are disturbed. Thus, shoveling of upper incisors has not been observed in any of the Neolithic samples, while the distal trigonid crest and the six-cusped lower first molars are found. This suggests, not that the Mongoloid dental complex *per se* was included in the Pit-Comb Ware population; but rather, that the presence of the Eastern phenes may be explained by admixture with the Mesolithic groups of mixed ancestry. This probable admixture most likely affected different populations to different extents. For instance, Benevolenskaya wrote about the similarity of two out of three Neolithic skulls from Karavaikha to the "euryprosopic (low-faced) type of Oleniy Ostrov", which was, in her opinion, of Eastern origin (1984: 50). But unlike Yuzhny Oleniy Ostrov, in the Karavaikha sample the Mongoloid markers are absent, as well as the markers of "evolutionary conservatism" (excluding labial convexity of the upper incisors). Though the latter trait is single and not a part of a dental complex, its presence may link the sample to the more ancient "evolutionarily conservative" groups. The Ryazan dental complex is different: the markers of the Eastern dental meta-race are prevalent (excluding shoveling of the upper incisors), while labial convexity of incisors is absent. The "evolutionary conservatism" set is only represented by the finger-like projections of upper frontal teeth, crista oblique, and metaconulus on upper molars. Thus, both dental complexes simultaneously present in the Mesolithic population of the North of the Russian Plain ("evolutionarily conservative" and Mongoloid) in the Neolithic groups were probably eliminated partially by genetic drift.

By contrast, dental morphology in the samples of the Dnieper-Donets representatives did not change substantially in comparison with the Mesolithic population. The Eastern markers are absent in most samples. The six-cusped lower molars are the only ubiquitous trait; but owing to its low frequency, this does not have a serious taxonomic value. The "evolutionary conservatism" traits are also very rare, except in the Vovnigi-2 sample, where this dental complex is almost as strongly pronounced as in the Upper Paleolithic Europeans.

Conclusions

The distribution and variation of dental nonmetric traits in the Mesolithic and Neolithic samples of the Russian Plain describe its population history as a complex process governed by many factors. There is solid evidence pointing towards a migratory influx from the East at the time of the Onega culture, or even earlier. The dental complex of the migrants included increased frequencies of shoveling, distal trigonid crest, and six-cusped lower molars accompanied by an increased robustness of mandibular second molars.

But the hypothesis about persistence of an autochthonous "evolutionarily conservative" dental complex, arising in the local Upper Paleolithic population in some Mesolithic and Neolithic groups, is supported as well. The highest prevalence of that complex is observed in the samples of the Onega Mesolithic culture and the Azov-Dnieper Neolithic culture, while some isolated "evolutionarily conservative" traits are found in the samples representing Kargopol and Ryazan variants of the Pit-Comb Ware culture.

The simultaneous presence of Mongoloid and "evolutionarily conservative" markers at Yuzhny Oleniy

Ostrov means that the long-term persistence of the Upper Paleolithic morphology in this group was not a result of biological isolation. This, in turn, makes it unlikely that undifferentiated dental complexes could have emerged simply as a result of genetic drift. As migration from the East did not lead to complete the disappearance of the "evolutionarily conservative" dental complex in the population of the North of the Russian Plain, it is plausible that such a conservation of ancient Upper Paleolithic morphology was due to its adaptive significance. The "erosion" of that complex was, rather, driven by the dispersal of post-Paleolithic groups across the Russian Plain, which led to the loss of some genetic lineages at the periphery of their areals.

References

Arkheologiya: Neolit Severnoi Evrazii. 1996
T.D. Belanovskaya, V.V. Bzhaniya, L.N. Gurina, G.I. Zaitseva, M.P. Zimina, M.V. Konstantinov, M.F. Kosarev, D.A. Krainov, L.Y. Krizhevskaya, S.V. Oshibkina, M.F. Potushnyak, A.S. Smirnov, D.Y. Telegin, V.I. Timofeyev, L.P. Khlobystin, N.A. Khotinsky, E.K. Chernysh. Moscow: Nauka.

Bailey S.E. 2002
Neandertal Dental Morphology: Implication for Modern Human Origins: Diss. PhD. Tempe: Arisona State Univ.

Bailey S.E. 2004
A morphometric analysis of maxillary molar crowns of Middle-Late Pleistocene hominins. *Journal of Human Evolution*, vol. 47: 183–198.

Balanovskaya E.V., Balanovsky O.P. 2007
Russkiy genofond na Russkoi ravnine. Moscow: Luch.

Benevolenskaya Y.D. 1984
K voprosu o morfologicheskoi neodnorodnosti kraniologicheskoi serii iz mogilnika na Yuzhnom Olenyem ostrove. In *Problemy antropologii drevnego i sovremennogo naseleniya severa Evropy*. Leningrad: Nauka, pp. 37–54.

Chikisheva T.A. 2012
Dinamika antropologicheskogo sostava naseleniya yuga Zapadnoi Sibiri v epokhi neolita – rannego zheleza. Novosibirsk: Izd. IAE SO RAN.

Debets G.F. 1956
Opyt graficheskogo izobrazheniya genealogicheskoi klassifikatsii chelovecheskikh ras. *Sovetskaya etnografiya*, No. 4: 74–94.

Denisova R.Y. 1997
Problema nalichiya mongoloidnogo komponenta v sostave drevnego naseleniya Vostochnoi Evropy. In *Neolit lesnoi polosy Vostochnoi Evropy: (Antropologiya Sakhtyshskikh stoyanok)*. Moscow: Nauch. mir, pp. 42–54.

Denisova R.Y., Graudonis Y.Y., Gravere R.U. 1985
Kivutkalnskiy mogilnik epokhi bronzy. Riga: Zinatne.

Der Sarkissian C., Balanovsky O., Brandt G., Khartanovich V., Buzhilova A., Koshel S., Zaporozhchenko V., Gronenborn D., Moiseyev V., Kolpakov E., Shumkin V., Alt K., Balanovska E., Cooper A., Haak W., The Genographic Consortium. 2013
Ancient DNA reveals prehistoric gene-flow from Siberia in the complex human population history of North East Europe. *PLOS Genetics*, vol. 9 (2). URL: http://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1003296

Gokhman I.I. 1986
Antropologicheskiye osobennosti drevnego naseleniya severa evropeiskoi chasti SSSR i puti ikh formirovaniya. In *Antropologiya sovremennogo i drevnego naseleniya Evropeiskoi chasti SSSR*. Leningrad: Nauka, pp. 216–222.

Khaldeyeva N.I. 2006
Rezultaty odontologicheskogo issledovaniya cherepa Kostenki-18. In *Doistoricheskiy chelovek: Biologicheskiye i sotsialnye aspekty*. Moscow: Orgservis-2000, pp. 171–185.

Khaldeyeva N.I., Kharlamova N.V., Zubov A.A. 2010
Sravnitelnoye odontologicheskoye issledovaniye "klassicheskikh" zapadnoevropeiskikh neandertaltsev. *Vestnik antropologii*, No. 18: 60–87.

Manni F., Vargiu R., Coppa A. 2007
Neural network analysis by using the Self-Organizing Maps (SOMs) applied to human fossil dental morphology: A new methodology. In *Dental Perspectives on Human Evolution: State of the Art Research in Dental Paleoanthropology*, Sh.E. Bailey, J.-J. Hublin (eds.). New York: Springer, pp. 81–101.

Newton J.R. 2011
Ancient Mitochondrial DNA from Pre-historic Southeastern Europe: The Presence of East Eurasian Haplogroups Provides Evidence of Interactions with South Siberians Across the Central Asian Steppe Belt: Masters Theses. Allendale (MI): Grand Valley Univ. URL: http://scholarworks.gvsu.edu/theses/5/

Scott G.R. 1977
Classification, sex dimorphism, association and population variation of the canine distal accessory ridge. *Human Biology*, vol. 49 (3): 453–469.

Scott G.R., Turner C.G. II. 1997
The Anthropology of Modern Human Teeth: Dental Morphology and its Variation in Recent Human Populations. Cambridge: Cambridge Univ. Press.

Segeda S.P. 2013
Nekotorye voprosy proiskhozhdeniya slavyan v svete dannykh antropologii. *Vestnik antropologii*, No. 4: 128–137.

Turner C.G. II, Nichol C.R., Scott G.R. 1991
Scoring procedures for key morphological traits of the permanent dentition: The Arizona State University Dental Anthropology System. In *Advances in Dental Anthropology*. New York: Wiley-Liss Inc., pp. 13–31.

Yakimov V.P. 1958
O drevnei "mongoloidnosti" v Evrope. *KSIE*, iss. 28: 86–91.

Zhirov E.V. 1940
Zametka o skeletakh iz neoliticheskogo mogilnika Yuzhnogo Olenyego ostrova. *KSIIMK*, vol. VI: 51–54.

Zubov A.A. 1960
Zubnaya Sistema. In *Iskopaemye gominidy i proiskhozhdeniye cheloveka*. Moscow: Nauka, pp. 360–382.

Zubov A.A. 1968
Odontologiya: Metodika antropologicheskikh issledovaniy. Moscow: Nauka.

Zubov A.A. 1974
Odontoglifika. In *Rasogeneticheskiye protsessy v etnicheskoi istorii*. Moscow: Nauka, pp. 11–42.

Zubov A.A. 1992
The epicristid or middle trigonid crest defined. *Dental Anthropology Newsletter*, No. 6: 9–10.

Zubov A.A. 2000
Morfologicheskoye issledovaniye zubov detei iz sungirskogo pogrebeniya 2. In *HOMO SUNGIRIENSIS: Verkhnepaleoliticheskiy chelovek: Ekologicheskiye i evolyutsionnye aspekty issledovaniya*, Ch. 19. Moscow: Nauch. mir, pp. 256–270.

Zubov A.A. 2006
Metodicheskoye posobiye po antropologicheskomu analizu odontologicheskikh materialov. Moscow: Etno-onlain.

Zubov A.A., Khaldeyeva N.I. 1993
Odontologiya v antropofenetike. Moscow: Nauka.

Zubova A.V. 2012
Odontologicheskiye dannye k probleme "mongoloidnosti" naseleniya Vostochnoi Evropy v mezoliticheskuyu epokhu. *Vestnik Mosk. Gos. Univ*. Ser. 23: Antropologiya, No. 1: 44–53.

Zubova A.V. 2013
Predvaritelnye rezultaty izucheniya arkhaichnoi sostavlyayushchei odontologicheskikh kompleksov naseleniya Evrazii. *Vestnik antropologii*, No. 4: 107–127.

Zubova A.V., Chikisheva T.A. 2015
Human teeth from the Upper Paleolithic site of Afontova Gora II, Southern Siberia: Morphology and affinities. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 43 (4): 135–143.

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An Upper Paleolithic Human Mandible and a First Cervical Vertebra from Afontova Gora II*

The remains (a mandible and an atlas) of two individuals, from the stratified Upper Paleolithic site Afontova Gora II, dating to 16–12 ka BP, are described. The mandible was from a 14–15-year-old female. Certain nonmetric traits indicate its anatomical modernity, and the dimensions are closer to those of modern adolescents than to those of Upper Paleolithic individuals of similar age. In comparison, the mandible of the Předmostí-5 female, while being close in biological age, shows a much greater projective length and a higher and wider ramus. Mandibles of Upper Paleolithic children from Sungir are more robust and show a larger intercondylar width and a higher and wider ramus. The modernity of the dimensions of the Afontova Gora mandible may be due to a diachronic tendency toward gracilization. The dimensions of the atlas suggest that it belonged to a female aged 20–25. However, the paucity of data on first cervical vertebrae from Upper Paleolithic humans makes it impossible to evaluate the taxonomic status of that find.

Keywords: *Mandible, atlas, morphology, Upper Paleolithic, Afontova culture, Afontova Gora II.*

Introduction

Afontova Gora II is one of the most famous Upper Paleolithic sites in Siberia. During rescue excavations carried out in 2014, before construction of a bridge crossing Yenisei River near Krasnoyarsk (Derevianko et al., 2014; Slavinsky et al., 2014), several cultural layers were found at the second and third terraces above the flood-plain. The layers are thought to represent a number of short-term hunting camps. Faunal remains, stone, horn and bone artifacts indicate that the assemblages can be attributed to the Upper Paleolithic Afontovo archaeological culture that existed on Yenisei 16th–12th ka BP.

The atlas, the mandible, and five teeth were found, during works at excavation area No. 24, embedded in the edge of the third terrace in cultural layer 2, associated with the roof of the landslide body. The bones were lying in concordance with the geological layer's slope. Associated archaeological finds included flakes, spalls, and faunal remains. The exceptional preservation of the bone

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artifacts points towards their rapid archaeologization. The occurrence of skulls of large mammals (reindeer, red deer, and wolf) in the same cultural horizon may imply the way the horizon was formed. The geological body was being formed inside an ancient relief-depression with a seasonal watercourse providing for permanent supply and sorting of sediments (including destruction of blocks of sediments containing artifacts) and a stable water-stand forming iron (II) oxides.

The present study aimed at providing a morphological description, and sex and age determination of the mandible and the atlas.

Methods and materials

The mandible and teeth of a young individual were studied. In the right half of the mandible, there were the first and second molars (M_1, M_2) *in situ*, as well as both M_3 molars at the early stage of eruption. Later, we received the isolated left second premolar (P_4) and the first molar (M_1) belonging to the same mandible.

Upon excavating, the mandible was fairly well preserved (Fig. 1). Its body had been subtly deformed *postmortem* transversally by pressure of the soil, which had produced multiple fractures in that direction. During drying, the mandible collapsed into two parts. The fracture line begins from the middle of the right medial incisor socket and passes obliquely, skirting the chin, to the base of the mandible body at the level of space between the right second premolar and the first molar. This fracture through the midline not only allowed correct measurements, but, moreover, helped to avoid the errors usual when measuring a deformed bone.

A comprehensive description of the mandible follows. In addition to its main dimensions, measured according to R. Martin's standard methodology modified after V.P. Alekseyev and G.F. Debets (1964) (see *Table*), the bony relief of the external and internal surfaces was also described. A compilation of published data on infants' mandible measurements relevant to the present study (Alekseyev, 1978: 229, tab. 43) was used as a reference dataset, along with measurements of the Upper Paleolithic skulls Sungir 2 and 3 and Předmostí 5. For interpretation of the bone relief pattern in the individual from Afontova Gora II, we used mostly descriptions of morphological variation in the mandible in modern populations from the dentistry literature (Persin, Elizarova, Dyakova, 2003; Tarasenko, Dydykin, Kuzin, 2013; Tarasenko, Kuzin, Mikoyan, 2014). The age of the individual was determined according to D. Ubelaker's permanent teeth crown formation and eruption scheme (1978: Fig. 62).

Another interesting osteological specimen from Afontova Gora II is a human first cervical vertebra (atlas). The bone is well-preserved, missing only a small part of the right superior articular facet and a piece of supero-anterior part of the vertebral arch. The spongy bone is partially naked here (Fig. 2).

Fig. 1. The mandible.

Fig. 2. The atlas.

The sex of the individual to whom the atlas belonged was determined using the recommendations of L. Dubreuil-Chambardel, who found substantial sexual differences in width of the atlas (1907); and also the technique developed by E.A. Marino, which involves more dimensions, and provides sex determination accuracy up to 75–85 % (1995). The vertebra was measured following the described methodology (Huggare, 1989, 1991; Huggare, Kylamarkula, 1985a, b; Gómez-Olivencia et al., 2007).

For age determination, the data on ossification-center emergence and fusion in the atlas were used (Schintz et al., 1951; Standards…, 1994).

Morphology of the mandible

The mandible, as an object of paleoanthropological studies, has received undeservedly little attention.

Metric variables and indices of the mandible from Afontova Gora II, and the reference data

Variable	Afontova Gora II		Sungir		Teshik-Tash, 9–10 years (late Pleistocene)	Kostenki XV, 5–7 years (25–21 ka BP)	Kostenki XVIII, 9–11 years (21 ka BP)	Mayak-2, 5–8 years (11–10 ka BP)	Předmostí			Modern children				
	Right part of the mandible	Left part of the mandible	No. 2, boy, 11–14 years (28–23 ka BP)	No. 3, girl, 9–11 years (28–23 ka BP)					No. 2, 6–7 years (27–25 ka BP)	No. 7, 12–14 years (27–25 ka BP)	No. 5, female, 15–16 years (27–25 ka BP)	9–11 years	12–14 years	14–15 years	15–16 years	15–17 years
65. Mandibular condylar width	107.0		113.0	109.0	122.0	88.0	–	–	100.0	101.0	–	99.8	104.1	105.2	106.3	110.2
66. Mandibular angular width	85.0		89.0	87.0	83.0	77.0	95.0	–	76.0	82.0	–	84.2	89.5	89.5	89.5	95.0
67. Mandibular anterior width	45.0		45.0	46.0	50.0	41.0	–	–	–	–	–	–	–	–	–	–
68. Mandibular length from angles	74.0		88.0	74.0	68.0	61.0	–	–	–	72.0	–	61.2	68.1	68.1	68.1	72
68 (1). Mandibular length from condyles	95.0		106.0	88.0	–	81.0	–	–	–	99.0	105.0	–	–	–	–	–
69. Symphyseal height	30.0		35.0	29.0	26.0	25.0	26.0	–	–	–	–	21.5	26.8	26.8	26.8	27.0
69 (1). Mental foramen height	25.5	24.0	26.8	27.2	26.0	23.0	26.0	20.0	–	–	–	21.1	24.2	24.6	25.0	25.7
69 (2). Height at the level of the second molars	22.0	21.4	–	–	–	–	–	–	21.5	–	–	–	–	–	–	–
69 (3). Mental foramen breadth	11.4	11.3	11	11	15	10.5	14.5	12	–	–	–	10.8	11	11.2	11.2	11.2
70. Ramus height	43.0	48.0	57.0	58.0	50.0	42.0	–	46.0	–	51.0	50.0	41.2	43.7	46.2	48.7	52.0
71a. Minimal ramus breadth	33.0	30.0	37.0	34.0	30.0	27.0	–	30.5	–	29.0	37.0	27.3	28.9	29.9	30.8	31.3
79. Ramus inclination angle	124.0	119.0	–	–	–	128.0	–	–	–	–	–	–	–	–	–	–
C. Chin angle	71.0		80.0	69.0	62.5	–	–	–	–	–	–	–	–	–	–	–

Note: The data on Sungir, Teshik-Tash, Kostenki, and Mayak are given after (Gerasimova, Astakhov, Velichko, 2007), data on Předmostí and modern children are given after (Alekseyev, 1978). In the reference data, measurements of both sides of the mandible are combined.

American anthropologist A. Hrdlička, in a comprehensive article, underlined the unique features of the mandible (1940). In his opinion, it is one of the most interesting parts of the human skeleton, from both phylogenetic and ontogenetic points of view. It still plays an important evolutionary role, as shown by its involutive temporal changes. It also demonstrates a strong correlation with the morphology of the upper jaw, and with the rest of the face and cranial base; provides unique information about age changes and sexually dimorphic features; reproduces features of distant ancestors; and is capable of functional adaptation (Ibid.: 281).

Nevertheless, at the present stage of development of physical anthropology, the human mandible receives close attention only in an evolutionary context, and mainly from the point of view of anatomical elements related to speech. Important information about interspecific differentiation of *Homo sapiens*, which can be obtained by studying mandibular morphology, is only superficially used by craniologists. While data on the size and shape of the adult mandibles are usually published, the morphological descriptions rarely include information on either bone-relief or asymmetrical variation. Juvenile individuals are mostly ignored, since typological complexes are usually described for the *adultus-maturus* age cohort. Owing to this fact, information about ontogenetic changes in the size and shape of the mandible, and the position of the nutrient foramina, canals, and tuberosities, is almost absent in the paleoanthropological literature.

Determination of age. The age of a buried individual can be reliably determined via the status of the dentition. In this case, all permanent teeth have emerged (excluding the third molars that exhibit the stage of leaving the socket, which usually occurs at about 15 years of age). The root of the second premolar is fully formed, which is typical of 15±3 years of age (Ubelaker, 1978: Fig. 62), i.e. 12–18 years. Taking into account the absence of attrition at the occlusal surface of the crown, and the weak development of the distal contact facet, it is possible to limit the biological age of the individual to the period between 14 to 16 years of age. The roots of the first molars are also fully formed. The initial stage of dental attrition is observed in both teeth: a subtle polishing of the cusp apices, and attrition of some small elements of the cusps. At the apex of the protoconid of the right tooth, there is a barely visible spot of naked dentine. The dental status described above is usually observed in modern populations at the age of 14–15. This age determination is further confirmed by absence of attrition of the second molars that also display fully formed roots. Summing up, basing on the status of the dentition, an age of 14–15 years can be assigned to the individual.

Determination of sex. The mandible morphology can be used as a criterion for assessing the sex of a specimen. Growth of the mandible generally ceases after full eruption of the permanent dentition. Thus, the size of the Afontova Gora II mandible can be considered close to the typical size in the population to which the individual belonged. The combination of apparent gracility of the mandible with fairly developed attachment site of the mimic musculature may indicate that the individual was of female sex.

Metrics of the mandible. Our opinion on the sex of the individual is further confirmed by the metric characteristics of the mandible (see *Table*). In this connection, it is notable that reference data for that age cohort (14–16 years), which could be used for statistical analysis, are very scarce in the literature. Adult mandibles cannot be used for this purpose. Though growth of the studied mandible is almost complete, it cannot be compared directly with adult mandibles, since the final shape of the mandible is affected by functional masticatory adaptation between 16–18 and 30–35 (*adultus*) (Alekseyev, Debets, 1964) years of age (Holmes, Ruff, 2011).

The studied mandible is markedly asymmetrical (see *Table*): the left ramus is 5 mm taller, 3 mm narrower, and has a smaller angle of inclination as compared to the right side. All measurements of the body are greater on the right side. While asymmetry of the mandibular body could have been compensated during functional adaptation to masticatory loading, the asymmetry of the ramus would probably not have changed, and would have remained the same for the rest of the individual's life.

The transverse (condylar and angular widths) and sagittal (lengths from the condyles and angles) measurements of the mandible (see *Table*) are typical of modern adolescents at the age of 14–17*. The mandibular body is a bit more massive and the ramus is wider as compared to the modern sample.

The mandible from Afontova Gora II differs substantially from the Upper Paleolithic specimens from Sungir 2 (boy, 11–14 years) and 3 (girl, 9–10 years). The latter display a greater condylar width and a taller and wider ramus. The mandible of the Neanderthal boy from Teshik-Tash differs even more from the studied specimen, in the same dimensions but to a greater extent (even taking into account the interspecific differences—absence of the chin and a smaller angle of protrusion of the chin). The Předmostí 5 mandible (Czech Republic), while being similar in terms of age and sex, displays a much greater projectional length from the condyles, wider and taller ramus. As the specimens from Sungir and Předmostí are dated to the 28–23 ka BP, some 10 thousand years before Afontova Gora II, the above-

*Unfortunately, these modern reference data were published for both sexes combined (Alekseyev, 1978: 229, tab. 43).

mentioned differences can be explained by the secular trend towards gracilization of the mandible, which in the studied individual has almost reached the modern level.

Macroscopic anatomical features. On the inner surface of the mandibular body, there is a groove in the medial plane preserved at the location of synostosis of the two parts of the mandible. The groove forms in the first year of postnatal life. The mental spine (*spina mentalis*) displays a complex morphology: its upper part appears as a tuberosity with a large nutrient foramen, while the lower part forms a well-defined tubercle (Fig. 3, *a*). In modern mandibles, the foramen is observed in 100 % of cases when the frontal teeth are present (Tarasenko, Dydykin, Kuzin, 2013); its location varies, but in most cases it is found in the upper part of *spina mentalis* (Gladilin, 2013: 74). There is also a prominent nutrient foramen in the left part of the mandibular body, just lateral from the digastric fossa (Fig. 3, *b*).

The fossae (*fossa digastrica*) are well-pronounced, which points to a strong development of their anterior venters. There are enthesopathies on the surfaces of the fossae—traces of sub-pathological bone-reaction in the muscle and connective tissue attachment-sites (Fig. 3, *c*). The etiology of the enthesopathies is not clear, owing mainly to the absence of reference data on normal variation of *fossa digastrica*.

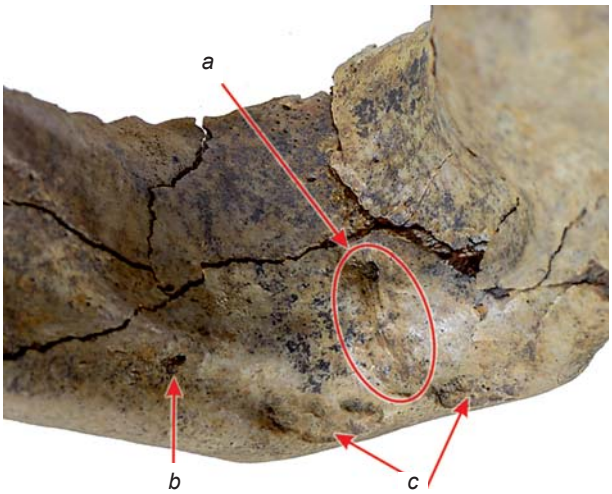

Fig. 3. Internal surface of the body of the mandible.
a – mental spine; *b* – supplementary nutrient foramen; *c* – digastric fossae.

The sublingual fovea (*fovea sublingualis*) (the lodge of the sublingual salivary gland) is substantially wider, deeper, and subtly porous in the right part of the mandible. The left submandibular fossa (*fovea submandibularis*), in which one of the salivary glands (submandibular) is also lodged, displays some porosity as well.

The mylohyoid line **(***linea mylohyoidea*), the lodge of the mylohyoid muscle (*m. mylohyoideus*), is weakly pronounced and asymmetrical. On the left side, it shows a ridge-like appearance, and it is disrupted at the level of the roots of the first molar. A disruptive pattern of this structure in modern mandibles is observed in 16 % of cases (Ibid.: 39). On the right side, the line is continuous, and in its lower parts it appears as a tuberosity; such morphology is observed in 48 % of modern specimens (Ibid.).

The attachment-sites of the medial and lateral pterygoid muscles involved in mastication also show asymmetry. The tuberosity of the medial pterygoid muscle (*tuberositas pterygoidea*) on the inner (lingual) surface of the mandibular angle is substantially more pronounced on the right side. The pterygoid fovea (*fovea pterygoidea*), the attachment site for the lateral pterygoid muscle, is also strongly expressed in the left condylar process neck. One-side contraction of these muscles moves the mandible to the right, and it is thus probable that the individual preferred chewing by the right side.

The mandibular foramina *(foramen mandibulae)* (Fig. 4), through which the nerves and vessels enter the mandible, are very large, just like the corresponding *lingula mandibulae.*

The mandibular torus *(torus mandibularis)* is weakly developed. The mental protuberance (*protuberantia*

Fig. 4. The mandibular foramina.

Fig. 5. Area of the mental protuberance of the mandible.

mentalis) and the mental tubercles *(tuberculum mentale)* are well-defined but asymmetrical—the right one is developed better (Fig. 5). They are separated from the main part of the body by fairly deep fovea, of which the left is strongly pronounced and has two small nutrient foramina. The mental foramina (*foramen mentale*) are oval-shaped, and reside in the spaces between the first and second premolars, which is the predominant pattern in modern populations. The external oblique line (*linea obliqua*) is mildly expressed in both sides of the mandible. It starts (in projection view) from the middle of the first molar socket, and does not reach the mental foramen.

The masseteric tuberosity (*tuberositas masseterica*), the masseter's attachment site on the external surface of the mandibular angle, is moderately expressed on both sides. The angles are weakly expanded outwards. The attachment sites of the temporal muscles *(m. temporalis*) are moderately pronounced on both sides. Contraction of both muscles results in elevation of the mandible, and in the individual from Afontova Gora II they were functioning symmetrically, in contrast to the muscles moving the mandible in the transverse direction.

Morphology of the atlas from Afontova Gora II

Macroscopic anatomical features and determination of age. The anterior tubercle of the atlas is fairly large, while the posterior tubercle is weakly developed. Behind the superior articular surfaces, there are marked grooves for the vertebral arteries. The transverse foramina are single.

The *fovea dentis* is of oval shape, and the long axis of the oval goes parallel to the anterior arch. The superior articular surfaces are smooth, and the left is divided into two parts by a groove. The tuberosity of the transverse ligament attachment site is pronounced moderately. On the inferior articular surface, subtle traces of porosity are observed. There is also marginal lipping up to 1 mm around the articular surface of the *fovea dentis*, superior and inferior articular surfaces.

On the basis of the timing of the appearance of ossification centers and fusion of the atlas, an age of 20 or more years was assigned to the individual. The complete fusion of the epiphyses of the transverse processes to the vertebral body, which is observed in the atlas from Afontova Gora II, usually occurs at this age and during the following several years (Schintz et al., 1951). Additional confirmation of the above is a complete fusion of the inferior epiphyseal ring of the vertebral body, which typically starts at 17–19 and finishes by 25 years of age (Buikstra, Gordon, St. Hoyme, 1984). The marginal lipping around both superior and inferior articular surfaces of the vertebra also indirectly points to the same age. Summing up, the individual was 20–25 years old or older.

Metrics of the atlas and determination of sex. Unfortunately, there is still a lack of solid reference data on the atlas metrics of Paleolithic *Homo sapiens*, and this makes applying statistical methods of comparison complicated. Accumulation of such data in future will help to integrate the morphology of the atlas from Afontova Gora II in the context of Paleolithic variation of this vertebra. Measurements of the atlas follow (in mm):

Maximum dorsoventral diameter (MaxDVDi)	39.4
Maximum transverse diameter (MaxTrDi)	67.0
Superior transverse diameter (SupTrDi)	47.3
Inferior transverse diameter (ITrDi)	41.9?
Canal dorsoventral diameter (M10)	30.3
Canal transverse diameter (M11)	26.3
Distance between the tuberosities for attachment of transverse ligament (DtTubTrLg)	17.3
Maximum craniocaudal diameter of the anterior tubercle (MaxCrCdDiAntA)	10.5
Maximum dorsoventral diameter (thickness) of the anterior tubercle (MaxDVDiAntTub)	5.7
Maximum transverse diameter for the facet for the dens (MaxTrDiFaDn)	11.0
Maximum craniocaudal diameter (height) of lateral mass (MaxCrCdDiLMa)	17.4
Maximum craniocaudal diameter of posterior tubercle (MaxCrCdDiPTub)	6.8
Maximum dorsoventral diameter of the posterior tubercle (MaxDVDiPTub)	3.1
Craniocaudal diameter of the groove for the vertebral artery (CrCdDiGr)	6.4
Upper articular facet: sagittal diameter (UFaSgDi)	22.7
Upper articular facet: transverse diameter (UFaTrDi)	11.7
Lower articular facet: sagittal diameter (LwFaSgDi)	13.8
Lower articular facet: transverse diameter (LwFaTrDi)	13.1

The sex of the individual can be reliably determined according to its dimensions. The maximum transverse diameter is 67.0 mm, and this is in the range typical of females (65–76 mm) and above the lower limit for males (74–90 mm) (Dubreuil-Chambardel, 1907).

We also used E.A. Marino's method for sex determination (1995), which is based on multiple regression and discriminant analysis of eight metric

variables of the atlas: if the values of functions are ≥ 0.5, the individual should be assigned female sex, and if it is < 0.5, male sex. In our case, we obtained values higher than 0.5, and so we can be confident that the individual was a female.

Conclusions

The skeletal remains found during excavation of the Afontova Gora II site represent two individuals. The study of the mandible lead us to the conclusion that it belonged to an adolescent girl 14–15 years old. Many morphological features of the mandible (complex morphology of the mental spine and a large nutrient foramen in its upper part, weak development of the mandibular torus, well-defined mental protuberance and the mental tubercles, shape and development of the mylohyoid line) are typical of modern human mandibular morphology. The metrics of the mandible from Afontova Gora II are closer to those of modern adolescents than to those of the Upper Paleolithic specimens. The Předmostí 5 mandible, while being similar in terms of age and sex, displays a much greater projectional length from the condyles, and a wider and taller ramus. The specimens of younger biological age from Sungir are more massive, and show a greater condylar width and a taller and wider ramus. As the burials in Sungir and Předmostí are some 10 thousand years older than the layer in Afontova Gora II in which the mandible was found, the above-mentioned differences can be explained by the secular trend towards gracilization of the mandible, which in the studied individual has almost reached the modern level.

According to the metrics of the atlas, the sex of the second individual can was definitely female. The fusion of most parts of the atlas to its body and a marginal lipping around articular surfaces of the vertebra suggest an age for the individual not less than 20–25 years. A lack of solid reference data on the atlas metrics from Paleolithic *Homo sapiens* makes applying statistical methods of comparison complicated. Accumulation of such data in future will help to integrate the morphology of the atlas from Afontova Gora II in the context of Paleolithic variation of this vertebra.

References

Alekseyev V.P. 1978
Paleoantropologiya zemnogo shara i formirovaniye chelovecheskikh ras: Paleolit. Moscow: Nauka.

Alekseyev V.P., Debets G.F. 1964
Kraniometriya: Metodika antropologicheskikh issledovaniy. Moscow: Nauka.

Buikstra J.E., Gordon C.C., St. Hoyme L. 1984
The case of severed skulls: Individuation in forensic anthropology. In *Human Identification: Case Studies in Forensic Anthropology*, T. Rathbun, J.E. Buikstra (eds.). Springfield: Ch.C. Thomas Publ. Ltd., pp. 121–135.

Derevianko A.P., Slavinsky V.S., Chikisheva T.A., Zubova A.V., Slepchenko S.M., Zolnikov I.D., Lysenko D.N., Drozdov N.I., Tsybankov A.A., Deyev E.V., Rybalko A.G., Stasyuk I.V., Kharevich V.M., Artemyev E.V., Galukhin L.L., Bogdanov E.S., Stepanov N.S., Dudko A.A., Lomov P.K. 2014
Novye antropologicheskiye nakhodki epokhi paleolita so stoyanki Afontova Gora II (predvaritelnoye opisaniye, kratkiy stratigraficheskiy i arkheologicheskiy kontekst). In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*. Novosibirsk: Izd. IAE SO RAN, pp. 431–434.

Dubreuil-Chambardel L. 1907
Variations sexuelles de l'atlas. *Bulletins et mémoires de la Société d'anthropologie de Paris*, No. 8: 399–404.

Gerasimova M.M., Astakhov S.N., Velichko A.A. 2007
Paleoliticheskiy chelovek, ego materialnaya kultura i prirodnaya sreda obitaniya. St. Petersburg: Nestor-Istoriya.

Gladilin Y.A. 2013
Morfologiya nizhnei chelyusti cheloveka. Saratov: Izd. Saratov. Gos. Med. Univ. im. V.I. Razumovskogo.

Gómez-Olivencia A., Carretero J.M., Arsuaga J.L., Rodríguez-García L., García-González R., Martínez I. 2007
Metric and morphological study of the upper cervical spine from the Sima de los Huesos site (Sierra de Atapuerca, Burgos, Spain). *Journal of Human Evolution*, vol. 53: 6–25.

Holmes M.A., Ruff C.B. 2011
Dietary effects on development of the human mandibular corpus. *American Journal of Physical Anthropology*, vol. 145: 615–628.

Hrdlička A. 1940
Lower jaw. *American Journal of Physical Anthropology*, vol. 27: 281–308.

Huggare J. 1989
The first cervical vertebra as an indicator of mandibular growth. *European Journal of Orthodontics*, vol. 11: 10–16.

Huggare J. 1991
Association between morphology of the first cervical vertebra, head posture, and craniofacial structures. *European Journal of Orthodontics*, vol. 23: 435–440.

Huggare J., Kylamarkula S. 1985a
Head posture and the morphology of the first cervical vertebra. *European Journal of Orthodontics*, vol. 7: 151–156.

Huggare J., Kylamarkula S. 1985b
Morphology of the first cervical vertebra in children with enlarged adenoids. *European Journal of Orthodontics*, vol. 7: 93–96.

Marino E.A. 1995
Sex estimation using the first cervical vertebra. *American Journal of Physical Anthropology*, vol. 97: 127–133.

Persin L.S., Elizarova V.M., Dyakova S.V. 2003
Stomatologiya detskogo vozrasta. Moscow: Meditsina.

Schintz H.R., Baensch W.E., Friedl E., Uehlinger E. 1951
Roentgen Diagnostics. New York: Grune and Stratton.

Slavinsky V.S., Akimova E.A., Lysenko D.N., Tomilova E.A., Kuksa E.N., Drozdov N.I., Anoikin A.A., Artemiev E.V., Galukhin L.L., Bogdanov E.S., Stepanov N.S., Grevtsov Y.A., Lomov P.K., Dudko A.A. 2014

Kostyanaya industriya stoyanki Afontova Gora II (po rezultatam raskopok 2014 goda). In *Problemy arkheologii, etnografii, antropologii Sibiri i sopredelnykh territorii*. Novosibirsk: Izd. IAE SO RAN, pp. 435–437.

Standards for Data Collection from Human Skeletal Remains. 1994

Proceedings of a Seminar at the Field Museum of Natural History, J. Buikstra, D.H. Ubelaker (eds.). Fayetteville AK: Arkansas Archeol. Survey. (Arkansas Archeol. Rep. Res. Ser.; No. 44).

Tarasenko S.V., Dydykin S.S., Kuzin A.V. 2013

Anatomo-topograficheskoye i rentgenologicheskoye obosnovaniye provedeniya dopolnitelnykh metodov obezbolivaniya zubov nizhnei chelyusti s uchetom variabelnosti kih innervatsii. *Stomatologiya*, No. 5: 44–48.

Tarasenko S.V., Kuzin A.V., Mikoyan A.S. 2014

Povysheniye bezopasnosti operativnykh vmeshatelstv na nizhnei chelyusti s uchetom topografii pitatelnykh otverstiy i mikrokanalov. *Rossiyskiy stomatologicheskiy zhurnal*, No. 6: 33–36.

Ubelaker D.H. 1978

Human skeletal remains: Excavation, analysis, interpretation. Chicago: Aldine publ. co.

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AN RT – Tatarstan Academy of Sciences

AN SSSR – USSR Academy of Sciences

ASGE – Archaeological Collection of the State Hermitage Museum

BAR – British Archaeological Reports

BNC SO RAN – Buryat Science Center, Siberian Branch of the Russian Academy of Sciences

GANIIIYL – Gorno-Altaysk Research Institute of History, Language and Literature (Gorno-Altaysk)

IA KN MON RK – A.K. Margulan Institute of Archaeology, Committee of Science of the Ministry of Education and Science of the Republic of Kazakhstan (Astana)

IA RAN – Institute of Archaeology, Russian Academy of Sciences (Moscow)

IAE SO RAN – Institute of Archaeology and Ethnography, Siberian Branch of the Russian Academy of Sciences (Novosibirsk)

IEA RAN – Institute of Ethnography and Anthropology, Russian Academy of Sciences (Moscow)

IPOS SO RAN – Institute of Northern Development, Siberian Branch, Russian Academy of Sciences (Tyumen)

KSIA – Brief Communications of the Institute of Archaeology, Russian Academy of Sciences

KSIIMK – Brief Communications of the Institute for the History of Material Culture

MAE RAN – Peter the Great Museum of Anthropology and Ethnography (the Kunstkamera), Russian Academy of Sciences (St. Petersburg)

MIA – Materials and Investigations on Archaeology in the USSR

NGU – Novosibirsk State University (Novosibirsk)

TIE – Transactions of the Institute of Ethnography

UrO RAN – Ural Branch of the Russian Academy of Sciences

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