

ПРОБЛЕМЫ ПАЛЕОПОЧВОВЕДЕНИЯ И ГЕОАРХЕОЛОГИИ

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О ВРЕМЕНИ ПОЯВЛЕНИЯ ЧЕЛОВЕКА СОВРЕМЕННОГО ВИДА НА СЕВЕРО-ВОСТОКЕ ВОСТОЧНО-ЕВРОПЕЙСКОЙ РАВНИНЫ И НА УРАЛЕ (ПО ДАННЫМ ИЗУЧЕНИЯ ПАЛЕОЛИТИЧЕСКОЙ СТОЯНКИ ЗАОЗЕРЬЕ)

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Палеолитическая стоянка Заозерье (40–34 тыс. л. н.) расположена в бассейне верхней Камы. Возраст, особенности каменного и костяного инвентаря и украшения, найденные в культурном слое памятника, позволяют уверенно отнести стоянку к началу верхнего палеолита. Комплекс инвентаря стоянки Заозерье имеет определенные черты сходства с инвентарем практически синхронных стоянок костенковской группы памятников начала верхнего палеолита (Костенки XIV, слой IVb и Костенки XVII, II слой). Памятник, вероятно, относится к одному из инициальных рейдов человека современного вида в Восточную Европу. Материалы стоянки Заозерье показывают, что человек современного вида впервые проник в субарктические широты Европы в обстановке интерстадиального потепления климата около 40 тыс. л. н., практически одновременно с его появлением в центре Восточно-Европейской равнины.

Ключевые слова: начало верхнего палеолита, северо-восток Европы, инициальное расселение в Субарктике

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1. INTRODUCTION

The history of occupation of the anatomically modern human and spreading of Upper Palaeolithic culture in Eastern Europe – one of the important topics of researches in Eurasian archaeology of the last decade (Hoffecker, 2009; Hublin, 2015; Hublin et al., 2020). Essential aspect of this fundamental problem is determination of the time of human occupation of the regions with extreme climatic conditions, including Arctic and Subarctic (Pavlov et al., 2004; Pitulko et al., 2004; Pavlov, 2015, 2021). The data obtained in the northeast of Europe – one of the few regions of Northern Eurasia where sites of the beginning of the Upper Palaeolithic are known – important for this research (Kanivets, 1976; Pavlov, 2008).

In the northeast of the East European plain, in the basins of Pechora and Upper Kama, and in the western foothills of Middle and Subpolar Urals four sites of the beginning of the Upper Palaeolithic are known (Pavlov, 2015). They are subdivided into two chronological groups. The sites existing in the region at the end of the Leningrad interstadial of Middle Valdai (GI9–H4) comprise the first group (43–34.5 kyr BP). These are sites Mamontova Kurya (Pechora River ba-

sin) and the Zaozer'e (Upper Kama River basin). Sites of the second chronological group (33–30 kyr BP), belong to the end of the Middle-beginning of the Late Valdai (GI5–H3) (Byzovaya, Pechora River basin and Garchi I, Upper Kama River basin) (Svendsen et al., 2010).

So even though it's impossible to make an unambiguous correlation one could suspect that at least some of the early phases of human occupation took place during "interstadials" rather than "stadials". It is noteworthy that the timing of the early human visits to the north seems to correspond with a long-lasting period when the Barents-Kara Ice Sheet was small or absent (Svendsen et al., 2010). According to Yu.N. Gribchenko (Gribchenko, 2017) judging from geomorphic and stratigraphic position of the Late Palaeolithic sites in the Upper Kama stream, it may be supposed that the most favorable conditions for the migrations of the prehistoric communities into the region developed there by the second half of the Middle Valdai interstadial (Gribchenko, 2006).

It is clear enough that the northward migration routes of the early communities depended heavily on physiographic characteristics of the region and specif-

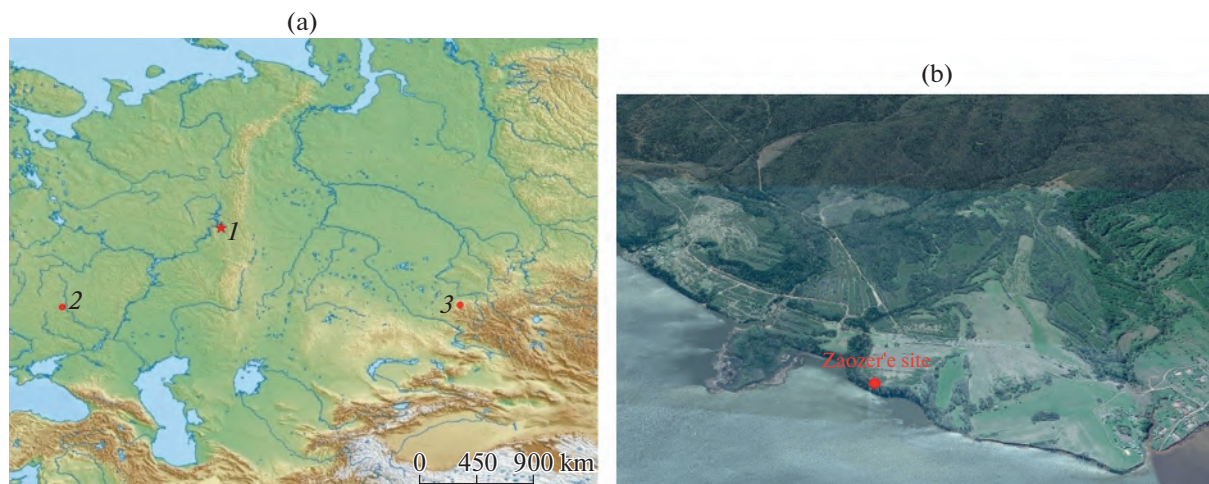


Fig. 1. Location map.

(a) – Location of the initial Upper Paleolithic (IUP) sites, mentioned in the text: 1 – Zaozer'e, 2 – Kostenki, 3 – Altai IUP sites. (b) – Zaozer'e topographical situation (Google Earth image).

Рис. 1. Расположение археологических памятников.

(a) – местоположение памятников начального верхнего палеолита, упоминаемых в тексте: 1 – Заозерье, 2 – Костенки, 3 – алтайские памятники. (b) – космоснимок расположения стоянки Заозерье (по Google Earth).

ic features of the relief-forming processes. Thin cover of snow during the winter seasons and a productive steppe with a dry and firm substrate were important factors that favored large animals and their predators. Rich herbivore diversity was probably a premise for human colonization at this high latitude. These environmental conditions also facilitated the mobility of humans (Svendsen et al., 2010).

2. ZAOZER'E SITE

Among the sites of the first chronological group the site Zaozer'e represents significant interest determined by geographical position, comparatively early age, and unique features of the site's assemblage (Pavlov, 2009). The site Zaozer'e (58°09'15" N; 56°56'32" E, 118 m a.s.l.) is situated on the south bank of the Kama Reservoir (former river Chusovaya), some 40 km to the east of Perm city (fig. 1). The age of the site according to radiocarbon and OSL dating 35–31 ¹⁴C kyr BP (41–34.5 cal kyr BP) (for details see: [Svendsen et al., 2010; SOM]). The site is located on a ledge in the river valley, on the promontory of third river terrace.

The site location is bounded on two sides by large gullies with steep slopes. The surface of the site itself rises gradually from 15 m above the reservoir to 18–22 m. The loess loam overlying the cultural layer forms a mantle varying in thickness from 4.5 to 3.0 m.

Site's stratigraphy was studied by Yu.N. Gribchenko (2006, 2017). According to his observations the cultural finds were mostly recovered from a humified horizon with distinguishable fragments of multiple-aged soil formation. Stone implements and animal bones are often confined to gleied lenses indicative of

excessive moistening periods at the time of human habitation (Gribchenko, 2006). Such formations may be related to buried seasonal-thawing layer dated to the middle Valday interstadial. After period of human occupation an active eolian and eolian-diluvial accumulation of loess started that was interrupted at least twice by short periods of the surface stability; those episodes were recorded by two levels of ephemeral soil formation and the development of large fault systems. The occurrence of the soil complex in the site sections displays signs of weak downslope movements. There are lenses of darker organic-rich material related genetically to an earlier soil formation (presumably dated to the Early Valday interstadial). The underlying horizon displays morphotypical characteristics of horizon B of the interglacial (Mikulino) fossil soil (Gribchenko, 2017). Three OSL-dates that were obtained from just below this zone gave ages in the range 104–92 ka BP, supporting the assumption that this basal part of the aeolian loess accumulated during MIS 5 (Svendsen et al., 2010).

Site's faunal remains include horse (*Equus sf. latipes*), woolly rhinoceros (*Coelodonta antiquitatis*), reindeer (*Rangifer tarandus*), hare (*Lepus timidus*), and mammoth (*Mammuthus primignius*) (ident. by P.A. Kosintsev, IPAE, Ekaterinsburg). Main object of hunting for the site's visitors was a horse. Dense elements of low food value are under-represented in inventory of skeletal parts, which apparently reflects selective retrieval of parts from the kill location. This assumption believes that the place of hunting was in the nearest vicinity of the site.

Along with the horse, the permanent object of hunting was such small animal as a hare. Bones of this

animal is found in the close to fireplaces within the living floors. Most likely, hares were hunted for the sake of fur, which was used for making warm clothes.

According to the palaeogeographical reconstruction the site the Zaozer'e was surrounded by open landscapes: the transition from the grassy forest to the steppe (Pavlov, 2009; Silaev et al., 2019).

Palynologist V.V. Pisareva concluded that, during the formation of a cultural layer near the site, probably in the valley of the river, was developed boreal and northern boreal vegetation. Local vegetation consisted of swamp, water and ruderal groups, characteristic for the forming terraces of river valleys and river floodplains. The vicinity of the site was swampy (Pavlov, 2009).

The site Zaozer'e in general, probably, represents remnants of several small temporary hunting camps visited for one or several seasons and situated on place, convenient for hunting. Despite the relatively small excavated area the site's (ca. 200 sq. m) overall layout can be set quite definitely. At least three find concentrations were recognized within the excavated area, and it appears as if each find category (e.g., bones, specific types of tools, and burnt materials) has a unique and restricted spatial distribution, suggesting some organized use of space during the period of human presence. The studied objects have, as a rule, one sharp boundary that probably demonstrates existence of an artificial barrier — a wind shield (?) (Svendsen et al., 2010).

The assemblage of the site contains more than 2 thousand artifacts. Besides stone implements the assemblage consist of bone and antler implements, and personal ornaments.

The main type of raw materials on the site (more than 50%) — gray-brown and dark gray concretion and tabular flint from outcrops in Upper Perm limestones. Pebbles from alluvial deposits, mainly dark gray and black Carboniferous siliceous slate, rhinestone and other siliceous rocks was also used (more than 30%). It should be notated that many fragments of siliceous slate found in several congestions near the fireplaces were probably subjected to thermal treatment (?).

Technology of primary knapping is characterized by prevalence of volumetric splitting. Preforms of edge-faceted (?) cores (fig. 2, 1), longitudinal chips from prismatic cores (fig. 2, 2) and crested blade (fig. 2, 4) are found. But radial core (fig. 2, 5) also presents in the site's assemblage. Among chips of systematic splitting large and middle blades dominate (fig. 3, 1–3, 9–13, 22–23).

End scrapers on flakes prevail in the assemblage's toolset. Large tools with ventral trimming dominate (fig. 2, 7, 9, 10), including high form end-scrapers with a straight edge (fig. 2, 6, 7), but majority of the scrapers has a convex edge with planar retouch (fig. 2, 11–13). Small scrapers made on rock crystal flakes with retouch on one of the longitudinal edges also present

(fig. 2, 14). End scrapers on blades practically absent: only single tool on distal part of large, massive blade (?) represented in the assemblage (fig. 2, 8).

The artefact assemblage can be categorized in two different classes according to the applied stone technology. The Upper Palaeolithic group represented by implements on blades. It consists of points (fig. 3, 28–31), burins on truncation and break (fig. 3, 4, 21), blades with marginal scalar and steep (in some cases abrupt) retouch (fig. 3, 14–20), segments (“lunates”) (fig. 3, 24, 25) and “arch-backed tools” (fig. 3, 26). It is possible that some implements with a burin spall in fact are cores for producing “Protoaurignacien” straight narrow bladelets (fig. 3, 27, 32). Fragments of such bladelets without secondary processing are available in assemblage (fig. 3, 5–8). Also, small curved lamellar chips without secondary processing which are, most likely, chips of fashion of edges of high form scrapers are found (bladelets *Dufour?*). Fragmentation of lamellar blanks also noted.

The second technical and morphological group of stone assemblage consisted of ovoid unifaces (fig. 4, 6, 8–11) and bifaces (fig. 4, 3, 7), the backed Kielmesser-type knife (fig. 4, 4) and partially bifacial straight side-scrapers (fig. 4, 1–2, 5). Practically all bifaces have plano-convex retouch which is the leading technological feature of the Middle Palaeolithic Kielmessergruppen industries (KMG) of Eastern Europe (Chabay, 2004).

Particularly noteworthy is the intensive reduction of many tools, and repeated rejuvenation of their working edges.

Implements made of antler and bone presented by blank of projectile (?) (fig. 5, 1), fragile awl (fig. 5, 3), and reindeer antlers cropped from one or two sides (fig. 5, 2). Retouchers on the fragments of large tubular bones also present in the assemblage. Abrasives of fine-grained sandstone for processing organic materials were found in the cultural layer (fig. 5, 12).

Personal ornaments are represented by the pendants of an oval form made of shell of freshwater *Unio* mollusks (fig. 5, 4–5) and beads from fossil crinoids (fig. 5, 7–8). One pendant has two one side drilled holes located near the center of the pendant. The second pendant is represented by a large fragment with a partly preserved hole. In the assemblage there are also a blank of such a pendant. Also blanks of polished ivory beads (?) and the ivory bladelets (fig. 5, 11) were found (fig. 5, 10). In the assemblage there is also a fragment of a roundish thin bone with two cut-through holes (fig. 5, 6) and the fragment of horse (?) rib dyed by ochre (fig. 5, 13).

Thus, the complex of the basic characteristics of the site, including spatial organization and the main features of the site's assemblage, completely fit within the AMH behavioral “package” (Benazzi et al., 2020) and unambiguously allow to relate Zaozer'e to the beginning of the Upper Palaeolithic.



Fig. 2. Zaozer'e. Stone assemblage.

Рис. 2. Заозерье. Каменный инвентарь.

3. DISCUSSION

The geographical location of the site the Zaozer'e, practically on border between Europe and Asia (fig. 1), causes the necessity to carry out its comparison with sites of two main neighbouring areas where the sites of beginning of the Upper Palaeolithic are known – East European and North Asian.

In the centre of the East European plain to sites of the initial stages of the Upper Palaeolithic (36–34 ¹⁴C kyr BP) belong sites of ancient chronological group of

the Kostenki region in the centre of East European plain (Dinnis et al., 2019) (fig. 1). These are resembling “Protoaurignacien” and early Aurignacien complexes of Kostenki XVII, layer II and Kostenki XIV (layers of IVb–IVw and LVA), Kostenki I (layer III) and also local Streletskian assemblages – Kostenki I, layer V, Kostenki VI, Kostenki XII, layer Ia and III (Dinnis et al., 2019).

The site Zaozer'e has a certain similarity on structure of assemblage and some technical and typological characteristics of stone implements with the sites of



Fig. 3. Zaozer'e. Stone assemblage.

Рис. 3. Заозерье. Каменный инвентарь.

“Aurignacoid” group of Kostenki sites and especially with assemblages of IVb layer of Kostenki XIV (36.5–35.5 ^{14}C kyr BP). For stone assemblage of this site, somewhat earlier than the Zaozer'e, blade technology of primary splitting is also characteristic. Assemblage characterized by combination of scrapers, dihedral burins, pieces esquilles and bifacial oval and subtrian-

gular implements. Noteworthy presence of bone tools and personal ornaments in the assemblage. Some traits of similarity could be traced with assemblage of the second layer of the Kostenki XVII. Last assemblage is completely deprived of any archaic features and the basic technical-morphological and technological characteristics refers to Proto-Aurignacien

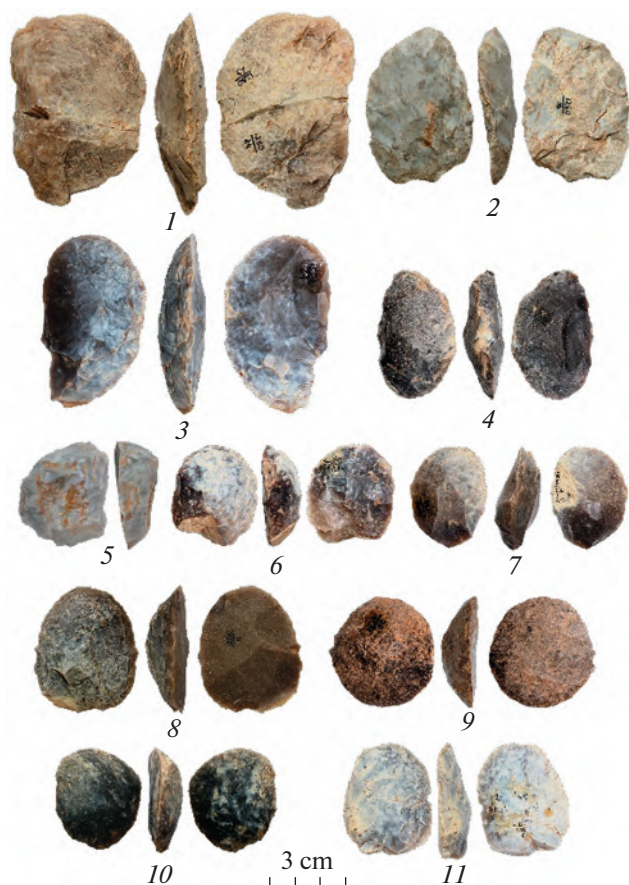


Fig. 4. Zaozer'e. Stone assemblage.

Рис. 4. Заозерье. Каменный инвентарь.

technocomplex (Dinnis et al., 2019). Some essential elements of this technocomplex, first, the volumetric knapping, and manufacturing of large blades, also characteristic for Zaozer'e assemblage.

Another common and important feature – the presence of personal ornaments in the assemblages of these sites. Personal ornaments of Zaozer'e and sites of the beginning of the Upper Palaeolithic of the Kostenki area also have undoubted lines of similarity. However, unlike stone assemblage, Zaozer'e kit of personal ornaments has significant similarity with ornaments from the second layer of Kostenki XVII. The pendants with drilled hole made of belemnite, the flattened pebbles, fossil corals and canines of polar fox are found in this layer (Stepanova et al., 2020). In addition, it should be noted that personal ornaments of the site Zaozer'e according to classification by M. Vanhaeren and F. D'Errico (2006), refer to the southern group of European Early Upper Palaeolithic ornaments to which use of shells of sea molluscs and fossils is characteristic.

Sites of the early stages of the Upper Palaeolithic also known in neighbouring Asian region – in Altai: These are such Initial Upper Palaeolithic (IUP) sites



Fig. 5. Zaozer'e. Bone implements and ornaments.

Рис. 5. Заозерье. Костяные изделия и украшения.

as Denisova cave (43–31 kyr BP), Kara-Bom (41–31 kyr BP), Ust-Karakol (35–30 kyr BP) (Belousova, 2018; Derevianko et al., 2020) (fig. 1). The stone inventory of these sites significantly retains characteristic of the local Middle Palaeolithic sites which preceded them. In the industry of the Initial Upper Palaeolithic (50–40 kyr BP), in the Denisova cave subprismatic and edge-faceted cores are often intended for producing large blades. Methods of radial and Levallois splitting also were used. Among tools side-scrapers of Middle Palaeolithic forms prevail. Upper

Palaeolithic categories are presented by the elongated points, end scrapers and burins, awls, *pieces esquilles*, retouched prismatic blades (Derevianko et al., 2020).

In the primary knapping of early Kara-Bom assemblages (46–43 kyr BP) the technology of bipolar splitting absolutely prevails. As characteristic tools of this tradition retouched points on blades with a ventral trimming of the base, the simple retouched points on blades and microblades, truncated-facetted implements and, perhaps, the *pieces esquilles* on blades could be mentioned (Belousova, 2018).

Obvious similarity to the Altai sites could be traced in personal ornaments. In layers of the beginning of the Upper Palaeolithic in the Denisova cave, the representative assemblage of a beads and pendants made of bone, stone and fossil shells are collected (Derevianko et al., 2020).

Thus, Zaozer'e has with Altai IUP stone industries some similarity in technology of primary splitting: use of subprismatic, edge-facetted and radial cores and the leading type of blank — a large blade. At the same time the typological features of the industries are significantly different. The industries of the beginning of the Upper Palaeolithic in Eastern Europe and Siberia also differentiated by Middle Palaeolithic substrate. Middle Palaeolithic component in East European's assemblages represented, as usual, by plano-convex bifaces which are *fossil directeur* of the European Middle Palaeolithic *Kielmessergruppen* (KMG) industries (Chabay, 2004), in contemporaneous Siberian assemblages Middle Palaeolithic component represented by Levallois forms typical for local Middle Palaeolithic (Derevianko et al., 2020). In general, Zaozer'e considerably differs on structure and technical-morphological features of the assemblages from significantly older Initial Upper Palaeolithic Altai sites.

Particularly noteworthy is the presence of crescent-shaped and arch-backed tools in Zaozer'e assemblage. These categories are one of the most distinctive typological features of the units of the beginning of the Upper Palaeolithic or Transitional industries such as Chatelpéronian in Central and Southern France and

Northern Spain, and Uluzzian in Italy and Greece (Hublin, 2015; Moroni et al., 2018; Stefanski, 2018). A few assemblages with arch-backed points have been reported from Central and Eastern Europe. Chronologically, these units are sandwiched between Mousterian and Aurignacian in Western and Southern Europe (Stefanski, 2018). Zaozer'e crescent-shaped tools resembles Uluzzian lunates (Villa et al., 2018), arch-backed points like those of Kraków Zwierzyniec 1 (Stefanski, 2018).

These sites belong to one of initial waves of the AMH occupation of European continent which began ca. 46 kyr BP (Hoffecker, 2011; Hublin et al., 2020). Data of the analysis of DNA of the first migrants show that wide spreading of the anatomically modern human in Europe was followed by continuous contacts with the native Neanderthal population (Fu et al., 2016; Hajdinjak et al., 2021). This fact could serve as plausible explanation of presence of Middle Palaeolithic component in some regional East European industries of the first half of the Upper Palaeolithic, including Zaozer'e.

4. CONCLUSIONS

The main features of Zaozer'e assemblages and spatial organization of the site itself evidently could be interpreted as requisites of a modern cultural model. Zaozer'e probably belongs to the first pioneer wave of modern humans moving into Eastern Europe, expanding from the south of the European continent. It is possible to assume that the Zaozer'e, along with sites like layer IVb-w Kostenki XIV, consist of group of sites of beginning of the Upper Palaeolithic which represent the distinct East European industrial tradition having common features with complexes of the beginning of the Upper Palaeolithic of Southern and Southwest Europe. The Zaozer'e materials demonstrate that modern humans reached the Northeast of the East European plain and the Urals (i.e., Subarctic zone of the Eastern Europe) ca. 40 cal. kyr.

ON THE TIME OF APPEARANCE OF ANATOMICALLY MODERN HUMANS IN THE NORTHEAST OF EAST EUROPEAN PLAIN AND IN THE URALS (BASED ON DATA FROM THE ZAOZER'E PALAEOLITHIC SITE)

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The article discusses the materials of the Palaeolithic site Zaozer'e (35–31 ¹⁴C kyr BP) situated on the North-East of East European plain in Upper Kama River basin. The age, distinctive features of stone and bone assemblage and the types of personal ornaments unambiguously allow to relate Zaozer'e to the beginning of the Upper Palaeolithic. The site's features incorporate most of the traits which have been interpreted as requisites of cultural model of the anatomically modern human (AMH). The assemblage of Zaozer'e site has certain

similarity to assemblages of the contemporaneous sites of the Kostenki group (Kostenki XVII, layer II and Kostenki XIV, layers IVb), but also yielded some implements resembling elements of the Uluzzian and Protoaurignacien assemblages of Southern and Southwestern Europe. The site's materials show that modern humans reached the sub-arctic zone of Eastern Europe during the relatively warm interstadial climate epoch ca. 40 cal. kyr practically concurrently with their first appearance in the central part of the East European Plain.

Keywords: beginning of the Upper Palaeolithic, North-eastern Europe, initial inhabitation of the Subarctic zone

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REFERENCES

- Belousova N.E. *Kamennye industrii nachala verkhnego paleolita Gornogo Altaya* (Stone assemblages of the beginning of the Upper Palaeolithic in Altai mountains). PhD thesis. Novosibirsk: IAEA (Publ.), 2018. 28 p. (in Russ.)
- Benazzi S., Arrighi S., Badino F., Bortolini E., Figus C., Lugli F., Marciani G., Oxilia G., Romandini M., Silvestrini S., Boscato P., Cipriani A., Moroni A., Negri F., Peresani M., Pini R., Ravazzi C., Ronchitelli A., and Spinapolice E. Peopling dynamics in the Mediterranean area between 45 and 39 ky ago: State of art and new data. *Quaternary International*. 2020. Vol. 551. P. 1–6.
<https://doi.org/10.1016/j.quaint.2020.06.029>
- Chabay V.P. *Srednii paleolit Kryma*. (The Middle Palaeolithic of Crimea). Simferopol: Shliakh (Publ.), 2004. 304 p. (in Russ.)
- Derevianko A.P., Shunkov M.V., and Kozlikin M.B. Who were Denisovan? *Archaeology Ethnology and Anthropology of Eurasia*. 2020. Vol. 48. No. 3. P. 3–32. (in Russ.)
- Dinnis R., Bessudnov A., Reynolds N., Deviese T., Pate A., Sablin M., Sinitsyn A., and Higham T. New data for the Early Upper Palaeolithic of Kostenki (Russia). *Journal of Human Evolution*. 2019. Vol. 127. P. 21–40.
<https://doi.org/10.1016/j.jhevol.2018.11.012>
- Fu Q., Posth C., Hajdinjak M., Petr M., Mallick S., Fernandes D., Furtwängler A., Haak W., Meyer M., Mitnik A., Nickel B., Peltzer F., Rohland R., Slon V., Talamo S., Lazaridis I., Lipson M., Mathieson I., Schiffels S., Skoglund P., Derevianko A., Drosdov N., Slavinsky V., Tsybankov A., Cremonesi R.-G., Mallegni F., Gély B., Vacca E., González Morales M., Straus L.-G., Neugebauer-Maresch C., Teschler-Nicola M., Constantin S., Moldovan O.-T., Benazzi S., Peresani M., Coppola D., Lari M., Ricci S., Ronchitelli A., Valentin F., Thevenet C., Wehrberger K., Grigorescu D., Rougier H., Crevecoeur I., Flas D., Semal P., Mannino M.A., Cuvillard C., Bocherens H., Conard N., Harvati R., Moiseyev V., Drucker D.G., Svoboda J., Richards M.P., Caramelli D., Pinhasi R., Kelso J., Patterson N., Krause J., Pääbo S., and Reich D. The genetic history of Ice Age Europe. *Nature*. 2016. Vol. 534 (7606). P. 200–205.
<https://doi.org/10.1038/nature17993>
- Gribchenko Yu.N. Environments of the Northeastern East European Plain at the time of the initial human colonization. *Human Colonization of the Arctic: The Interaction Between Early Migration and the Paleoenvironment*. Moscow: Academic Press (Publ.), 2017. P. 105–136. (in Russ.)
- Gribchenko Yu.N. Lithology and Stratigraphy of loess-soil series and cultural layers of Late Palaeolithic campsites in Eastern Europe. *Quaternary International*. 2006. Vol. 152–153. P. 153–163.
<https://doi.org/10.1016/j.quaint.2005.12.006>
- Hajdinjak M., Mafessoni F., Skov L., Vernot B., Hübner A., Fu Q., Esse E., Nagel S., Nickel B., Richter J., Moldovan O.-T., Constantin S., Endarova E., Zahariev N., Spasov R., Welker F., Smith G.M., Sinet-Mathiot V., Paskulin L., Fewlass H., Talamo S., Rezek Z., Sirakova S., Sirakov N., McPherron S., Tsanova T., Hublin J.-J., Peter B., Meyer M., Skoglund P., Kelso J., and Pääbo S. Initial Upper Palaeolithic humans in Europe had recent Neanderthal ancestry. *Nature*. 2021. Vol. 592. P. 253–257.
<https://doi.org/10.1038/s41586-021-03335-3>
- Hoffecker J. The early Upper Paleolithic of Eastern Europe reconsidered. *Evolutionary Anthropology*. 2011. Vol. 20. P. 24–39.
<https://doi.org/10.1002/evan.20284>
- Hoffecker J. The spread of modern humans in Europe. *Proceedings of the National Academy of Sciences (PNAS)*. 2009. Vol. 106. No. 38. P. 16040–16045.
<https://doi.org/10.1073/pnas.0903446107>
- Hublin J.-J. The modern human colonization of western Eurasia: when and where? *Quaternary Science Review*. 2015. Vol. 118. No. 1. P. 194–210.
<https://doi.org/10.1016/j.quascirev.2014.08.011>
- Hublin J., Sirakov N., Aldeias V., Bailey S., Bard E., Delvigne V., Endarova E., Fagault Y., Fewlass H., Hajdinjak M., Kromer B., Krumov I., Marreiros J., Martisius N.L., Paskulin L., Sinet-Mathiot V., Meyer M., Pääbo S., Popov V., Rezek Z., Sirakova S., Skinner M.M., Smith G.M., Spasov R., Talamo S., Tuna T., Wacker L., Welker F., Wilcke A., Zahariev N., McPherron S.P., and Tsenka Tsanova T. Initial Upper Palaeolithic Homo sapiens from Bacho Kiro Cave, Bulgaria. *Nature*. 2020. Vol. 581. P. 299–302.
<https://doi.org/10.1038/s41586-020-2259-z>

- Kanivets V.I. *Paleolit krainego severo-vostoka Evropy* (The Palaeolithic of North-Eastern Europe). Moscow: Nauka (Publ.), 1976. 98 p. (in Russ.)
- Moroni A., Ronchitelli A., Arrighi S., Aureli D., Bailey S., Boscato P., Boschini F., Capecchi G., Crezzini J., Douka K., Marciani G., Panetta D., Ranaldo F., Ricci S., Scaramucci S., Spagnolo V., and Benazzi S. The Uluzzian in the mirror. *Journal of Anthropological Sciences*. 2018. Vol. 96. P. 125–160.
- Pavlov P. On the human occupation of the northeast of East European plain and the Urals at the beginning of Upper Palaeolithic (MIS 3). *Academia Letters*. 2021. Article 2077. <https://doi.org/10.20935/AL2077>.
- Pavlov P.Yu. On Initial inhabitation of the Northern Urals. *Urals Historical Journal*. 2015. Vol. 47. No. 2 P. 50–60. (in Russ.).
- Pavlov P.Yu. The Palaeolithic of North-Eastern Europe: new data. *Archaeology Ethnology and Anthropology of Eurasia*. 2008. Vol. 33. No. 1. P. 33–45. <https://doi.org/10.1016/j.aear.2008.04.014>
- Pavlov P.Yu. Zaozer'e: an early Upper Paleolithic site in the European Northeast. *Rossiiskaya arkheologia (Russian Archaeology)*. 2009. No. 1. P. 5–17. (in Russ.)
- Pavlov P., Roebroeks W., and Svendsen J-I. The Pleistocene Colonization of Northeastern Europe: A Report on Recent Research. *Journal of Human Evolution*. 2004. Vol. 47. No. 1–2. P. 3–17. <https://doi.org/10.1016/j.jhevol.2004.05.002>
- Pitulko V.V., Nikolsky P.A., Giryа E.Yu., Basilyan A.E., Tumskey V.E., Koulakov S.A., Astakhov S.N., Pavlova E.Yu., and Anisimov M.A. The Yana RHS Site: Humans in the Arctic Before the Last Glacial Maximum. *Science*. 2004. No. 303. P. 52–56. <https://doi.org/10.1126/science.108521>
- Silaev V.I., Shanina S.N., Smoleva I.V., Kiseliyova D.V., Cheredinchenko N.V., Khazov A.F., Tumanova E.A., and Pavlov P.Yu. *Opyt ispol'zovaniya mineralogo-geokhimicheskikh svoystv kostnykh ostatkov dlya rekonstruktsii sredy obitaniya na paleoliticheskoi stoyanke Zaozer'e (Srednii Ural)*. (Testing the use of mineralogical and geochemical characteristics of fossil bone remains as a tool for reconstructing palaeolandscapes at the Paleolithic site of Zaozer'e (Middle Urals). *Pervobytnaya arkheologia. Journal mezhdistsiplinarnykh issledovaniy (Prehistoric Archaeology. Journal of Interdisciplinary Research)*. 2019. No. 2. P. 35–77. (in Russ.)
- Stefanski D. The Early Upper Palaeolithic assemblage of arch-backed points from Kraków-Zwierzyniec site 1. Multas per gentes et multa per saecula. Amici magistro et collegae suo Ioanni Christopho Kozłowski dedicant (Krakow: Jagellonian Univ. Press). 2018. P. 63–70.
- Stepanova K., Maliutina A.A., Giryа E.Yu., and Bessudnov A.A. Personal ornaments of the Initial Upper Palaeolithic sites in Kostenki: raw material selection and technology of processing. *Proc. of VI (XXII) Russian Archaeological Congress in Samara*. Vol. 1. Samara. 2020. P. 88–90. (in Russ.)
- Svendsen J-I., Heggen H.P., Hufthammer A-K., Mangerud J., Pavlov P., and W. Roebroeks. Geo-archaeological investigations of Palaeolithic sites along the Ural Mountains – On the northern presence of humans during the last Ice Age. *Quaternary Science Reviews*. 2010. Vol. 29. No. 23–24. P. 3138–3156. <https://doi.org/10.1016/j.quascirev.2010.06.043>
- Vanhaeren M. and D'Errico F. Aurignacian ethno-linguistic geography of Europe revealed by personal ornaments. *Journal of Archaeological Science*. 2006. Vol. 33. No. 8. P. 1105–1128. <https://doi.org/10.1016/j.jas.2005.11.017>
- Villa P., Pollarolo L., Conforti J., Marra F., Biagioni C., Degano I., Lucejko J.J., Tozzi C., Pennacchioni M., Zanchetta G., Nicosia C., Martini M., Sibilia E., and Panzeri L. From Neandertals to modern humans: new data on the Uluzzian. *PLoS ONE*. 2018. Vol. 13. No. 5. <https://doi.org/10.1371/journal.pone.0196786>