

## Network in Eastern European Neolithic and Wetland Archaeology

Scientific Cooperation between Eastern Europe and Switzerland

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Photograph (back page): Underwater photograph of wooden piles at Lake Ohrid, Ploča Michov Grad, North Macedonia (photo: Johannes Reich; University of Bern, 2018)

Editors

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## Foreword

The aim of this book is to document the activities performed during and arising from the Institutional Partnership of the NEENAWA (Network in Eastern European Neolithic and Wetland Archaeology for the improvement of field techniques and dating methods) project. Over the course of four years, public lectures, research exchanges, organization of workshops, conferences and scientific sessions led to an intense transfer of knowledge between the involved researchers. This book can be considered as a contemporary historical document, how Swiss and Eastern European researchers from Russia, North Macedonia and Ukraine came together in the scope of the NEENAWA partnership. Activity and experience reports keep record of the various actions and events that took place in the partner countries but they also witness to the scientific and structural development of wetland and underwater archaeology in Eastern Europe. Even beyond the partner countries, contacts were established and intensified with other Eastern European states (e.g. Greece, Albania, Lithuania).

During the intense weeks spent together on excavations, excursions or in seminars, friendships developed apart from close scientific collaborations. For both the partners as well as the participants, NEENAWA has been an enriching and fruitful experience. The structural changes affecting institutions or individual researchers reflect important steps in their development and career.

A special emphasis was put on the integration of undergraduate students; many of them continued their scientific career in archaeology, with a special focus on the topics taught during the project. The international collaboration between students ultimately resulted in independent research projects.

Most importantly, during the project, an understanding and appreciation of cultural and structural differences, but also similarities was gained by all involved participants. What started as cooperation between institutions, ended as an equal partnership to the gain of prehistoric archaeology in general and wetland archaeology in particular.

### Disclaimer

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The choice of names or spelling of names used in this volume reflects in no way any sympathy for a particular political or national orientation. Transliteration of Cyrillic names into English was done by the individual authors and might therefore vary between contributions.

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#### **II.A.4 Bone, Antler and Teeth Items In the Dnepr-Dvina Area (NW Russia) In the Neolithic – Bronze Age (VI–III mill. BC): Technological-Functional Features and Cultural Attribution**

Neolithic sites with well-preserved organic objects are not numerous in the Dnepr-Dvina region. Such items were found in Usvyaty IV, Dubokray I and Dubokray V, Serteya II, Serteya X, Rudnya Serteyeskaya, Naumovo, Udvyaty I, Dyazditsa I and II (researches of A.M. Miklyaev, A.N. Mazurkevich and T.I. Bepalova; The State Hermitage Museum, Russia). Bone and antler collections from these sites include more than 300 objects. These sites are attributed to the early to late Neolithic and the beginning of the Bronze age (VI–III mill. BC), based on specific ceramics, flint industry and radiocarbon dates (Мазуркевич et al. 2016).

Bone and antler collections include finished products (utilitarian and non-utilitarian ones), preforms and production wastes. This set of items allows analyzing manufacturing techniques and the function of tools. The preservation conditions of the items' surfaces are quite good, which gives the opportunity to analyze them on a macro- and microlevel (according to use-wear analysis method).

Bones of wild animals (elk, red deer, bear, boar etc.) and birds were used as raw materials. Bones of elk were used more often than bones of boar and bear, both for the production of tools and objects of non-utilitarian character during the whole Neolithic period and at the beginning of the Bronze age. Only bones with the largest durability – leg bones (tibiales and tibiae, metapodiums, humeral and radial bones), ribs and antlers were processed. Species diversity of processed bones varied within different archeological cultures of this region (Саблин et al. 2011).

Two stages of raw material processing were distinguished as a result of the technological analysis of bone and antler artefacts. Preforms made for various categories of items and traces of primary treatment related to it are characterized by the following operations: fracture with the help of heavy object, longitudinal or latitudinal knapping using preliminary prepared (in a case with antler raw materials – notched) grooves, knapping using the cracks, transversal fracture by bending or chopping. Different operations could be made on the preform – scraping, drilling, abrasion and polishing. These operations were connected with the secondary treatment of the preform. These traces overlap, usually, traces of the preform making, sometimes partly or entirely destroying them. That is why the existence of not only finished pieces but also items with traces of different stages of modelling is very important in order to reconstruct the whole "chain of operation sequence" (Малюткина, Саблин 2014). Treatment was made by flint tools. Only at late stages of the settlement Usviaty IV (layer A, the Bronze age) traces of treatment by a metallic tool can be recorded. In general, care of production differs for the whole assemblage, that does not allow defining in some cases neither raw materials nor the mode of treatment.

Macro- and microtraces analysis allowed determining tools' function. The available material, in general, reflects a typical usage of bone and antler tools for the Neolithic period: treatment of skins (piercing, cutting and scraping), wood treatment (from removal of bark and piercing of birch bark to objects' making), work with wet and dry clay (production of pottery). A wide variety of implements was used in hunting and fishing. A specific place is occupied by ornaments and objects of art. In addition, the analysis of microtraces has allowed to reveal specific, not standard, forms of bone and antler tools whose purpose was not clear.

The early Neolithic settlements Serteya X and Rudnya Serteyeskaya revealed various types of arrowheads, which are typologically similar to finds from the Baltic region attributed to the Narva



culture (Мазуркевич, Микляев 1998). A poor toolkit was found here (fig. 1), and its morphological and technological features have no continuation in tradition of bone and antler treatment with the settlements of the middle and late Neolithic. Not numerous tools found on these sites testify specific economic and cultural specialization of these temporary sites and/or the places of hunting.

Settlements of the Usvyaty Middle Neolithic culture (Usvyaty IV, Dubokray V, Dyazditsa I, II, and part of materials of Serteya II) are characterized by a set of various bone and antler tools. Ways of treatment and making items from bone and antler on these sites is similar, as they had a common origin connected to the builders of the pile-dwelling settlements (Мазуркевич 1998). Almost all categories of tools made of bone and antler were found here, they display the complete range of ancient economy (fig. 2, 3, 4). A definite set of the most widespread tools represents specifics of processing and usage of tools made of bone, antler and teeth. *Spatules* for pottery treatment are characteristic for the middle Neolithic settlements (fig. 2: 8, 13; fig. 4: 9), mostly made in the same technique: longitudinal cut-out plate from a tubular bone diaphysis, flat and spongy bone served as a preform. Smoothing of bone sides and spongy tissue was made by scraping and grinding. In certain cases, it is scratched out almost completely, and the plates thickness, in that case, reaches slightly more than 2 mm. There are small items (up to 10 cm) and bigger ones. They are either decorated or not, with a figured handle (fig. 2: 13), one with a carefully made image of the animal head on its extremity (fig. 2: 8; fig. 8), others with a simple handle. One tool has a notched part of the handle (with a comb) on one end (fig. 2: 4). It was formed on a thin plate, longitudinally cut out from animal's rib. The plate was broken transversally. Then, one end was worn out by planing and grinding, nine prongs were cut out on another extremity. Edges of the prongs were sharp and irregular. Apparently, this tool was used to put decor pottery. *Spoons* were cut out from flat bones (most likely, scapulas) (fig. 2: 3; fig. 4: 8). The plates were prepared by scraping and grinding. Traces of these operations can be clearly seen on surfaces. *Spoon bowls*, judging by two entirely preserved objects, could be different – from slightly concave to deep. *Chisels* with direct, slightly convex edge were found on the settlement Usvyaty IV (5 pieces) and Dubokray V (2 pieces) as fragments and complete forms (fig. 2: 8, 14; fig. 4: 3, 10). All of them were made in the same technology. Fragments of elk metapodia, small boars' tibias and other tubular bones served as preforms. They can be divided into several groups – with an epiphysis–handle and without it. Symmetric narrow edge was made out on the opposite end by planing and abrasive grinding of those items, and the bone epiphysis served as a handle. In other cases, the fragment of a tubular bone was worn out additionally by means of transversally chopping of sides, longitudinal planing and grinding of symmetrically pointed narrow edge. The tip of the edges is, as a rule, softly dulled, sometimes was insignificant eroded. Spongy tissue of a bone on the opposite end of the tool is in certain cases strongly hammered. According to the trace wear analysis on the items' working parts, this category of tools was used in work with fresh wood.

Side metapodium of elk served as the main raw materials for production of awls, in lesser quantity – boars' tibiales and other undetermined fragments of tubular bones of medium-sized animals (fig. 2: 5; fig. 4: 5). Processing techniques of awls from side metapodium of an elk was rather simple due to the natural pointed shape of the bone. Small epiphyses of bones served as a handle whereas at the opposite end, a working edge was formed by longitudinal planing. Removal of one epiphysis and a further planing of a working edge was applied in case of boars' tibiales. *Sinkers* made of tubular bone fragments (3 pieces) and *spinner* made of boar's tusk (1 item), that were found only on the settlement Usvyaty IV, belong to fishing equipment (fig. 2: 9, 10). Sinkers are made by planing and cutting of small fragments of tubular bones. On both ends of such

products, grooves for rope fastening were cut out. *Fish-spear* and *harpoons* (fig. 2: 7; fig. 4: 11) are attributed to the same category of items (fig. 2: 11).

Various types of arrowheads are also represented in the collection (fig. 2: 12; fig. 4: 6, 7, 12). The following categories are referred to objects of non-utilitarian character: *flutes* made of birds' tubular bones (fig. 3: 7, 10), *pendants* made of bears' tusk, elk and boars' incisors (fig. 3: 8, 9, 11), *cover plate* made of tubular bones (fig. 3: 2, 3), ornaments – *cover plates* on clothes (fig. 3: 4), a massive *hook* made of the top shoot of elk lower jaw (fig. 3: 5), specific *baton* (fig. 3: 1) with figured image of bird head (crow?) on the one end and possibly *harness element* (for dogs?) (fig. 3: 6) made of an antler prong. An anthropomorphic figure ("idol") was found on the site Usvyaty IV (fig. 9). The item is formed from an antler prong. The figure is made with a special attention to the anatomy of the body. Its face was made schematically: deep eyes under expressed eyebrow ridges, a straight nose and opened, "calling" mouth. Traces of production did not survive. The whole surface of the idol was carefully smoothed and polished. It is difficult to identify whether this polishing was connected with special processing of the item or storage and carrying in a leather bag. The item from Dyazditsy II was made in the same stylistics. The artefact represents a fragment of a tubular bone on which human faces were cut out (one of two masks remained partially) (fig. 7). Traces from cutting can be clearly seen on its surface. This item was not finished. It served most likely as a preform for small anthropomorphic figures.

Late Neolithic traditions were also formed on the basis of preceding Middle Neolithic culture (Мазуркевич et al. 2009). Certain categories of implements (*spatules*, for example) were still in use, however, also new forms and new categories appeared (*scrapers* for wood treatment). Collections from the settlements Naumovo, Udvaty I, Dubokray I and Serteya II are not so numerous, but various and also new items appeared. *Awls*, *knives*, *spatules*, different types of arrowheads with various preforms were found in the settlement Naumovo (fig. 5). *Pressure flaker* was found in the settlement Dubokray I (1 ex.) (fig. 4: 4). This small tool was made of a bear's elbow bone fragment with a handle. In one human burial of the site Udvaty I (burial 1, bone chamber No. 3), there were pendants made of various wild animal teeth and tubular bones (fig. 6).

Analysis of macro and microtraces on ornaments' surface connected with items' production and use allowed us to divide the items into two groups. Items made of tubular bone belong to the first group (14 items) (fig. 6: 1-10, 12-15). All of them represent small (up to 2 cm in length), trapezium-shaped plates, no more than 5 mm thick, with drilled hole in a narrow part of pendants. Traces of pendants production did not remain. A zone with polishing inside and on the edges of holes in the top part was traced on almost all items attributed to this group. Concentric traces of drilling on these areas were not traced. It might be connected with a possible way of pendants fastening – items were densely sewn to clothes in which the person was buried. Pendants made from various wild animal teeth (24 items) and one pendant-beading made of bird tubular were attributed to the second group (fig. 6: 11, 16-38). Dog (or a badger?) canines, elk incisors, bear molars and tusks were used. Additional treatment of teeth was recorded only on elk incisors. In a root part of six teeth traces of scraping, namely the longitudinal scratches preparing place for hole making, remained. In those cases where holes remained partially or completely, they have concentric traces of drilling by flint drill. Utilitarian wear traces, which might appear as a result of fastening or carrying pendants, were not recorded inside the holes or near them. Traces connected with contact or friction of pendants with each other were neither traced. Thus, it is possible to assume that pendants made of animal teeth were strung on a lace (all together or some sets) shortly before their placement on a body of a buried person.

Results of the technological and functional analysis have provided information about bone and antler raw materials value in the life of ancient hunter-gathering communities in Dnepr-Dvina



interfluvial, about methods of its treatment and tools function. This material reflects contacts with the neighboring regions, interferences of cultural traditions and ways of their adaptation according to local resources. Unfortunately, it is only a small part of material culture which survived.

Materials of Neolithic lake-dwelling settlements of Switzerland are represented within a well-preserved archaeological context. Bone and antler implements represent a significant part of utilitarian and non-utilitarian complex of artefacts throughout the whole Neolithic period of this region. Well-established technological methods of bone and antler raw materials processing, functionally formed forms of tools with well-preserved wooden fastening elements (handles, arrowhead shafts and fastening organic materials) are distinctive feature of Neolithic cultures of Circum-Alpine foreland (Schibler 2013). The analysis of context along with utilitarian macrowear on a working part of an item allows defining its function. Thus, bone and antler artefacts of Circum-Alpine foreland Neolithic settlements used as reference material might be of a great importance in the analysis of bone, antler and teeth implements from the Neolithic period and the beginning of the Bronze age on the territory of Dnepr-Dvina interfluvial. Comparison of two, at first sight, culturally different ancient communities reveals also some common elements traced through details (for example, ways of boar's tusks treatment for morphologically similar tools processing (scrapers) used for wooden treatment).

Thanks to the participation in NEENAWA project, I got the possibility to see bone, antler and teeth items of Neolithic pile-dwelling settlements from Switzerland and exchange experience of technological and functional analysis with colleagues from the University of Basel (IPNA).

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#### References

- Мазуркевич, А. Н. (1998). О происхождении усвятской культуры среднего неолита. *Проблемы археологии*. Вып. 4. СПб., 77-85.
- Мазуркевич, А. Н., Микляев, А. М. (1998). О раннем неолите междуречья Lovati и Западной Двины. *АСГЭ*. Вып. 33. СПб., 7-33.
- Мазуркевич, А. Н., Зайцева, Г. И., Кулькова, М. А., Долбунова, Е. В., Семенов, А. А., Ришко, С. А. (2016). Абсолютная хронология неолитических древностей Днепр-Двинского междуречья VII-III тыс. до н.э. Радиоуглеродная хронология эпохи неолита Восточной Европы VII-III тыс. до н.э. Смоленск, 317-356.
- Малютин, А. А., Саблин, М. В. (2014). Выбор сырья и первичная обработка костяного и рогового материала торфяниковой неолитической стоянки Усвят IV. *Записки ИИМК РАН*, №9. СПб., 21-31.
- Саблин, М. В., Пантелева, А. В., Сыромятникова, Е. В. (2011). Археозоологический анализ остеологического материала из неолитических свайных поселений Подвинья: хозяйство и экология. *Труды Зоологического института РАН*. Том 315, №2. СПб., 143-153.
- Mazurkevich, A., Dolukhanov, P., Shukurov, A., Zaitseva, G. (2009). Late Stone – Early Bronze Sites Age in the Western Dvina – Lovat Area. In: Dolukhanov, P., Sarson G. R., Shukurov, A. M. (eds.). *The East European Plain on the Eve of Agriculture*. BAR International Series 1964. Oxford, 145-153.
- Schibler, J. (2013). Bone and antler artefacts in wetland sites. In: Menotti, F. and A. O'Sullivan (eds.). *The Oxford Handbook of Wetland Archaeology*. Oxford University Press, Oxford, 339-355.

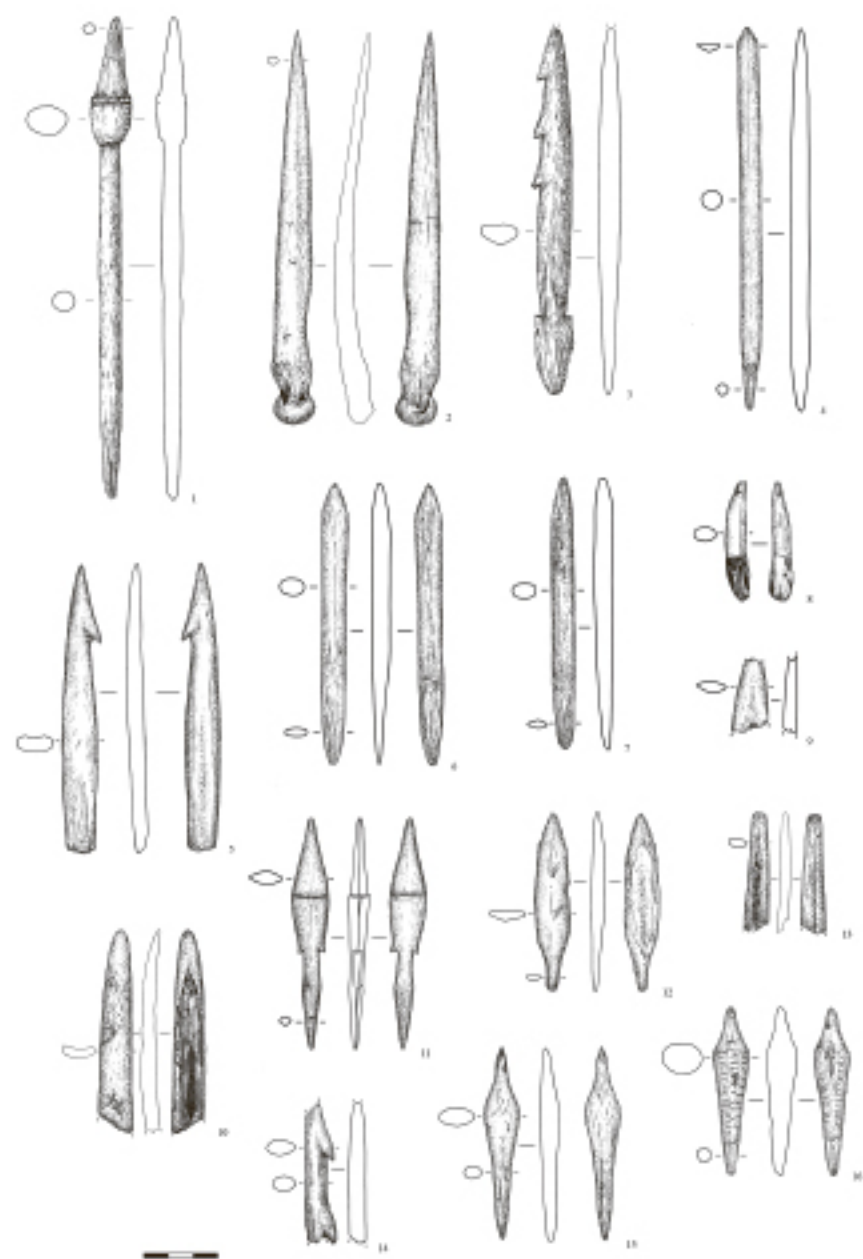


Fig. 1: Bone, antler and teeth items. 1-4, 6, 7, 10, 11, 13 – Rudnya Serteysskaya; 5, 8, 9, 12, 14, 15, 16 – Serteya X; 1, 4, 6, 7, 9, 11, 12, 15, 16 – arrowheads; 2 – awt; 3, 5, 14 – harpoons and spear-head; 8 – pendant; 10, 13 – tools.

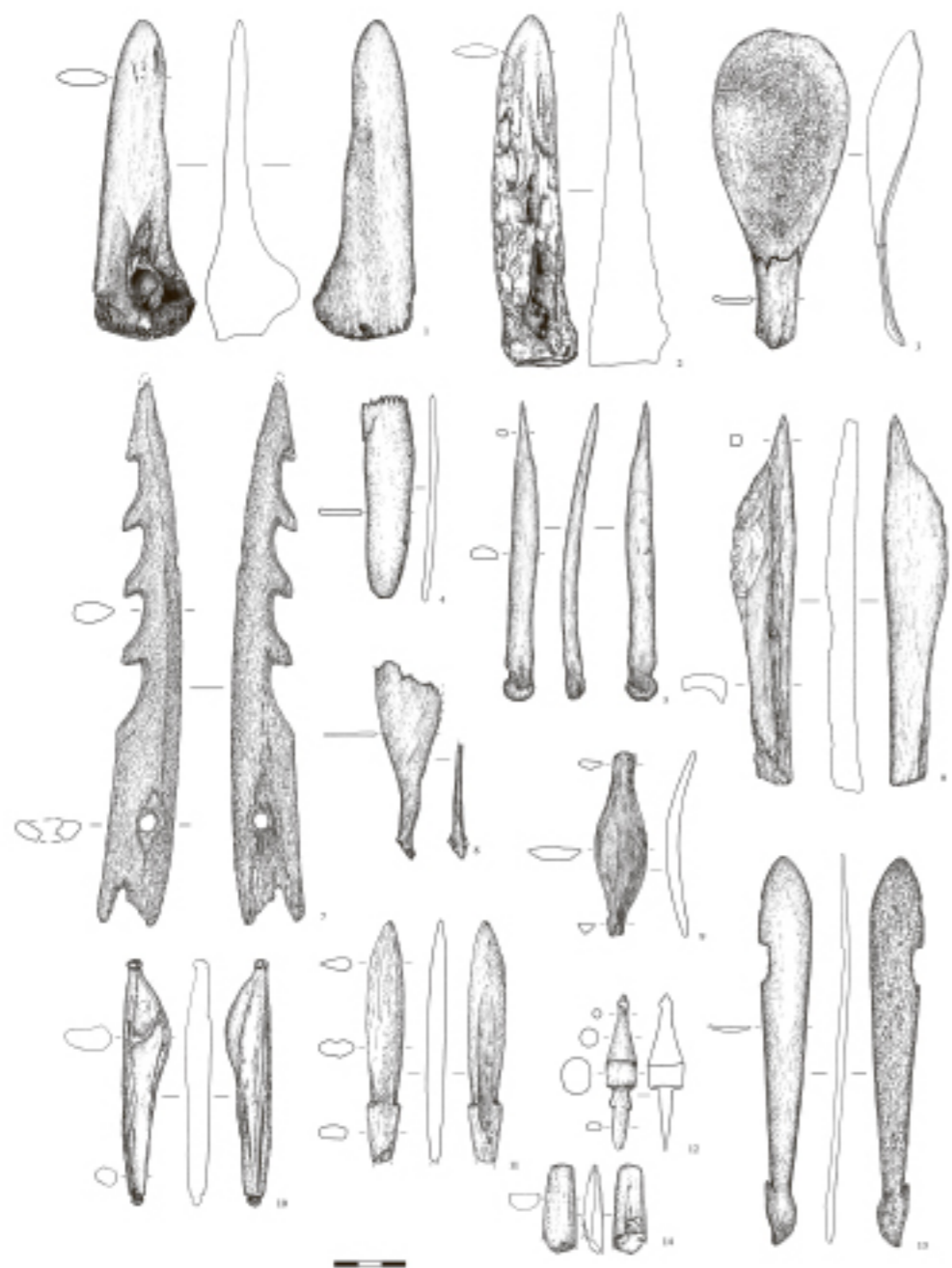


Fig. 2: Bone, antler and teeth items. Usyaty IV. 1, 2 – daggers; 3 – spoon; 4 – spatula with prongs; 5 – awl; 6, 14 – chisels; 7, 11 – harpoons and spear-heads; 8, 13 – spatules; 9 – spinner; 10 – sinker; 12 – arrowheads.

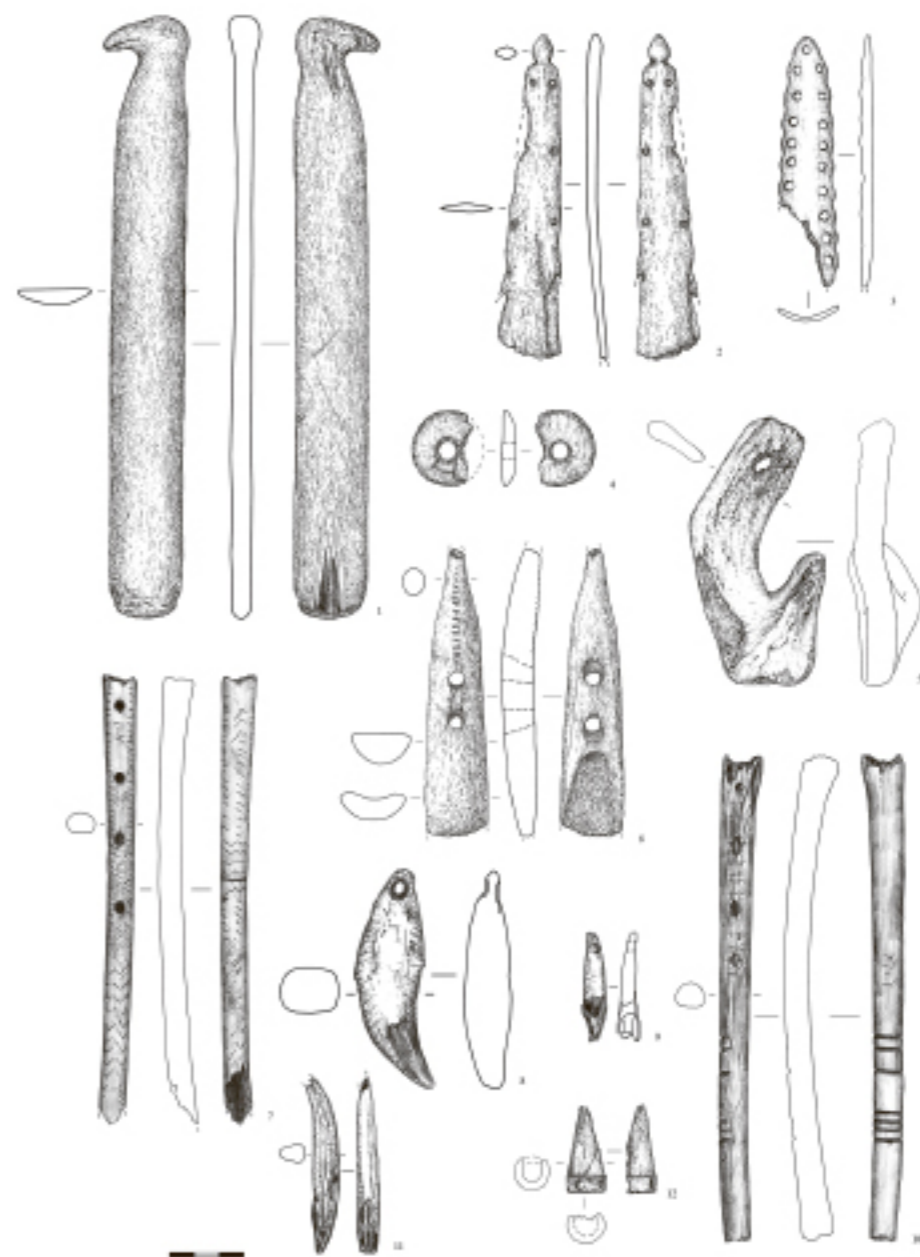


Fig. 3: Bone, antler and teeth items. 1-6, 9, 11, 12 – Usyaty IV; 7, 8, 10 – Dubokrai V. 1 – baton, 2-4 – cover plates; 5 – hook; 6 – element of harness; 7, 10 – "flutes"; 8, 9, 11 – pendants; 12 – fragment of antler item.



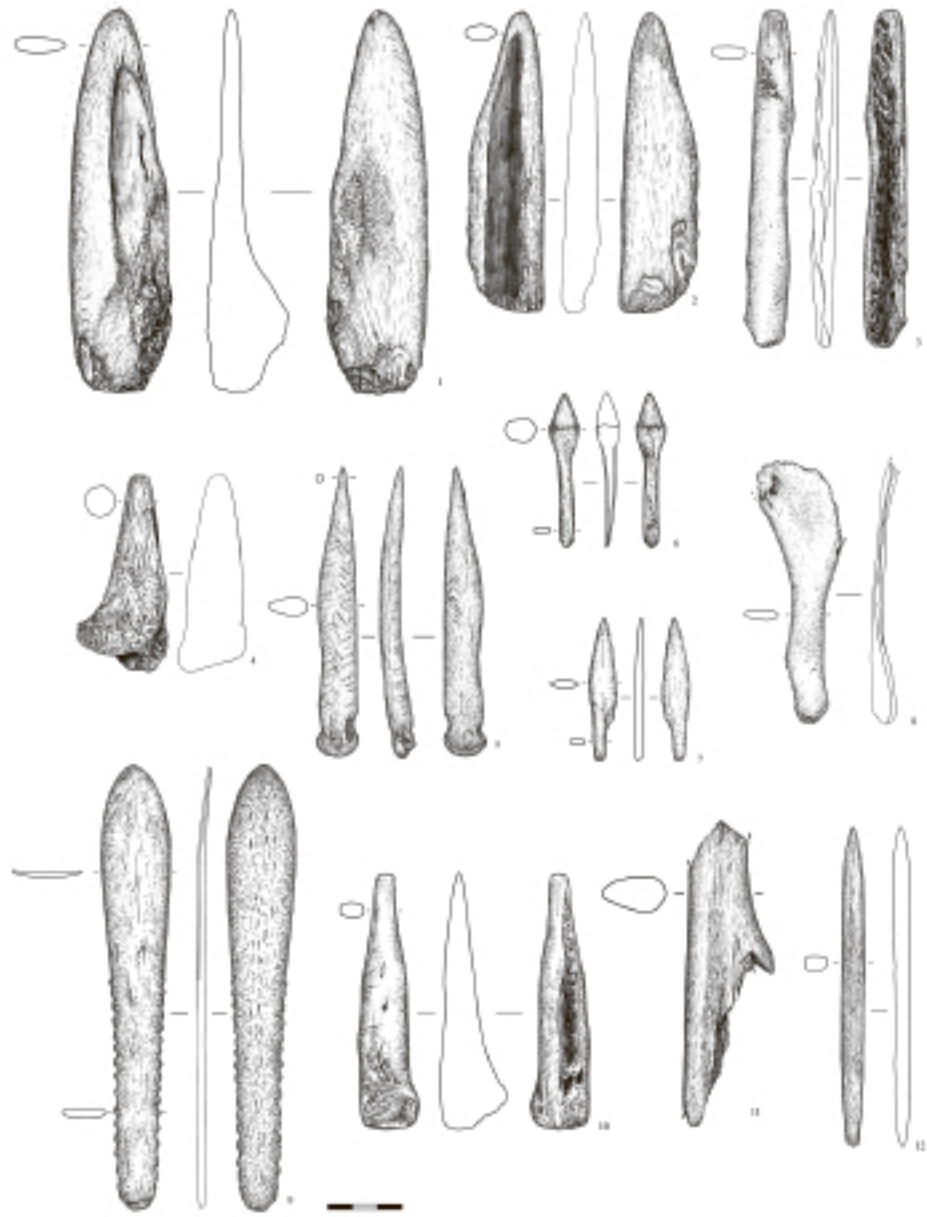


Fig. 4: Bone, antler and teeth items. 4 – Dubokrai I; 1–3, 5–12 – Dubokrai V. 1, 2 – daggers; 3, 10 – chisels; 4 – pressure flakers; 5 – awl; 6, 7, 12 – arrowheads; 8 – fragment of spoon; 9 – spatula; 11 – fragment of harpoon.

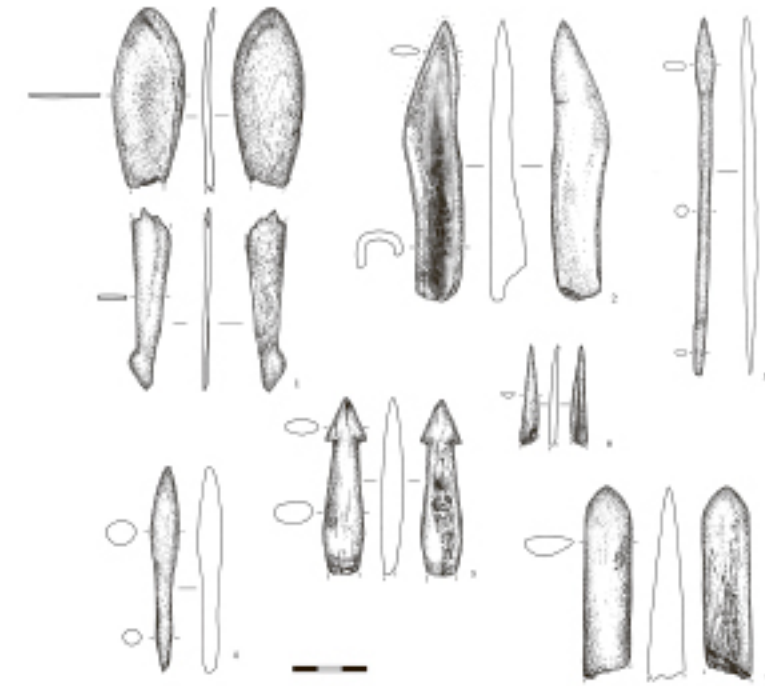


Fig. 5: Bone, antler and teeth items. Naumovo. 1 – spatula; 2 – knife; 3, 4, 5 – arrowheads; 6 – awl; 7 – chisel.





Fig. 6: Udyaty I. Pendants made of bone, antler and teeth of wild animals.



Fig. 7: Dyuzditsy II. Item made of tubular bone with anthropomorphic faces.



Fig. 8: Usvyaty IV. Zoomorphic decoration of spatula handle.



Fig. 9: Usvyaty IV. Antler figurine.