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LATE MESOLITHIC BONE INDUSTRY IN THE CENTRAL RUSSIAN PLAIN

The Mesolithic in the Volga–Oka region has been under investigated for a long time. Up to the present time more than 500 settlements have been studied. These sites are distributed rather regulary on the studied territory. A major part of these settlements have been excavated extensively and flint inventory can be referred to reliable sampling. However, settlements with well preserved bone and antler implements were really unknown till now, except for several small settlements on the Ivanovskoe and Berendeevo peat-bogs. The small number of artifacts in these collections does not allow us to exactly characterize the Mesolithic bone industry.[1]

During recent years several clusters of Mesolithic-Neolithic sites were investigated in the upper Volga basin within the Dubna river valley. An important site in this cluster is the multilayer settlement Zamostye 2, where Late Mesolithic and Early Neolithic cultural layers have been investigated.

The Zamostye 2 site is situated in the Sergyev-Posad district of the Moscow region, in the northern part of the Middle Russian Plain. The site was discovered in 1987 and since 1989 it was explored by an expedition of the Institute of Archaeology of Russian Academy of Sciences.

The settlement lies in the flood plain of the Dubna river. The favourable conditions of quick peat-bog formation contributed to the best preservation of the bone and antler implements. The numerous palynological analyses as well as C^{14} dates (7840 ± 90 (GIN-6196), 7900 ± 180 (GIN-6197) B.P. etc) indicate a period of settlement from the late Boreal to the beggining of the Atlantic period, or in other words, to the end of the Mesolithic in this territory.

The large collection of stone and bone implements recovered during the investigations allows to determine the place of this settlement among the others and to characterize the Late Mesolithic stone and bone industies in this region.

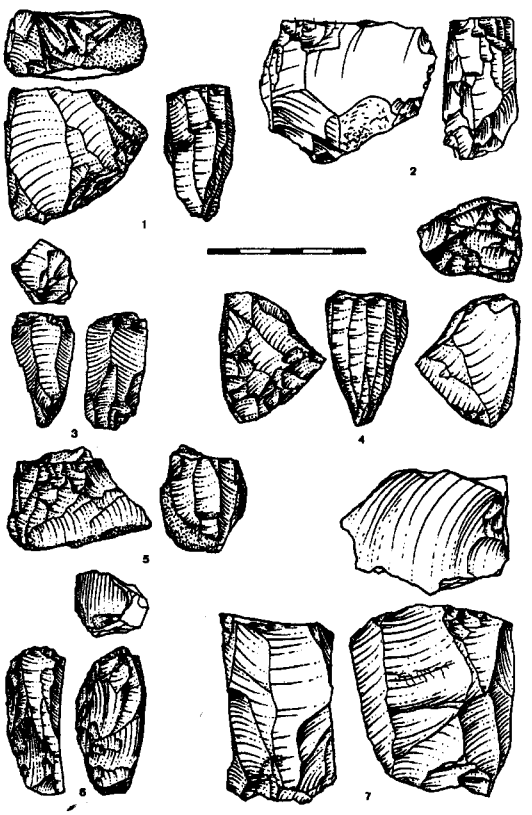

Fig. 1. Zamostye 2: cores (flint)

[1] Krainov D. A., Khotinsky N. A., Ivanovskie stoyanki – complex meso-neoliticheskikh ozerno-bolotnykh poseleniy na Volgo-okskom mezhdurechye. Archeologia i paleogeographya mesolita i neolita Russkoy ravniny. M. 1984; Utkin A. V., Kostyaniye izdeliya so stoyanok Berendeevo 4 i 8, KSIA, 177, M.1984.

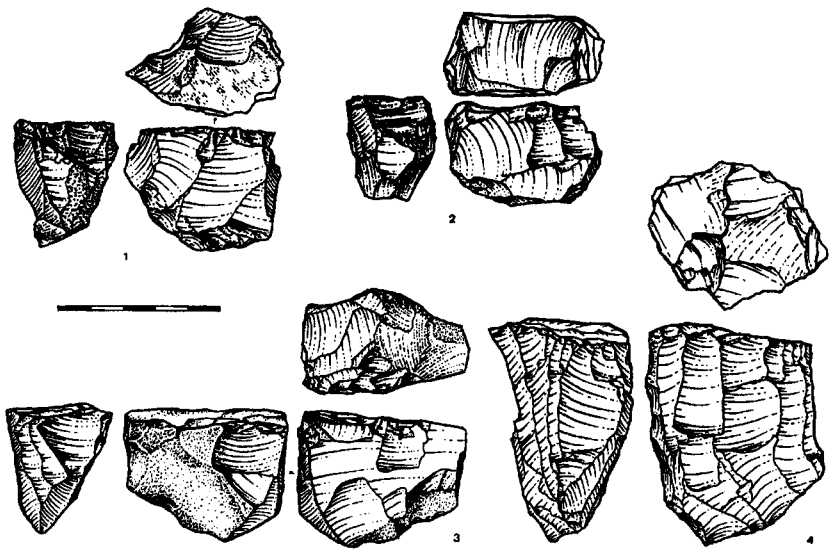

Fig. 2. Zamostye 2: cores (flint)

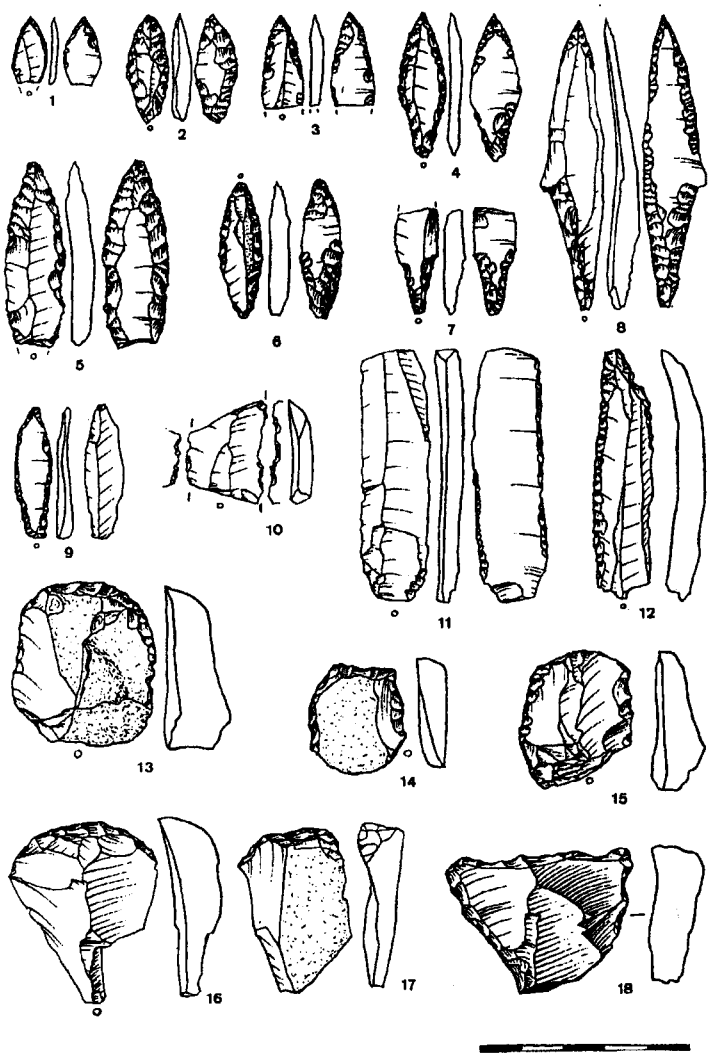

Fig. 3. Zamostye 2: 1–9 – arrow-heads; 10–12 – retouched blades; 13–18 – scrapers (flint)

Excavations of the Mesolithic layers (about 200 sq. m) yielded about 9000 stone and 1700 bone and antler implements.

STONE INDUSTRY

The vast majority of materials from Zamostye 2 comprises primary flakes without traces of secondary working. Stone tools number 1666 items.

If we analyse the tool-kit of the Mesolithic layer, we see that most of tools (scrapers, burins, awls etc.) were made on flakes of various forms and dimensions. Tools on blades constitute 17% of the assemblage. The blades were used mainly for making arrow-points and inserts, the latter made from bladelets.

Such a strong predominance of flakes in the tool-kit is unusual for the Mesolithic settlements of the Post-Swiderian tradition in this region, where the percentage of the tools on blades is higher (usually – from 30% to 75%).[2]

It was felt that this phenomenon requires aditional explanations, and so careful attention was given to technological analysis of the collection aimed at reconstructing the knapping technology and identifying the reasons for the differences between the ordinary Mesolithic settlements in the Volga–Oka region and the collection from Zamostye 2.

During the excavations 518 cores were collected, of which only 193 can be used for any analyses because the rest are nodules with chaotic traces of knapping. All the regular cores fall into the following main categories: 1. keeled

[2] Sorokin A. N., Mezolit Velikikh Mescherskikh ozer, SA. 1984. 1.

cores with one platform; 2. platform partial cores; 3. conical cores. Types 1 and 2 have flake and blade scars. The third type of cores features negatives of blade and bladelets only (Fig. 1; 2).

The main type of cores were the keeled variety made from flat parent nodules of flint. The sides of nodules were prepared by facetting to shape the keel of the core. The striking platform was shaped by flakes detached transversaly from one or two ends. The longitudinal trimming of the platform edge was performed prior to the production of flakes. The preparation of the striking platform and its subsequent trimming were done with goal of producing blades and bladelets, but as we mentioned above, in most cases this was not possible because of the low quality of raw materials (flint with numerous crystalline inclusions – Fig. 2). In several instances of high-quality flint we can see nice negatives of normal pressure bladeletes (Fig. 1:1–3). However, most of these cores produced only flakes of various forms and dimensions. An indication that these cores were used to produce blades or bladeletes is the presence of numerous core-rejuvenation flakes removed from the core platform in such way as to provide fresh striking platforms with enough angle for blade removing.

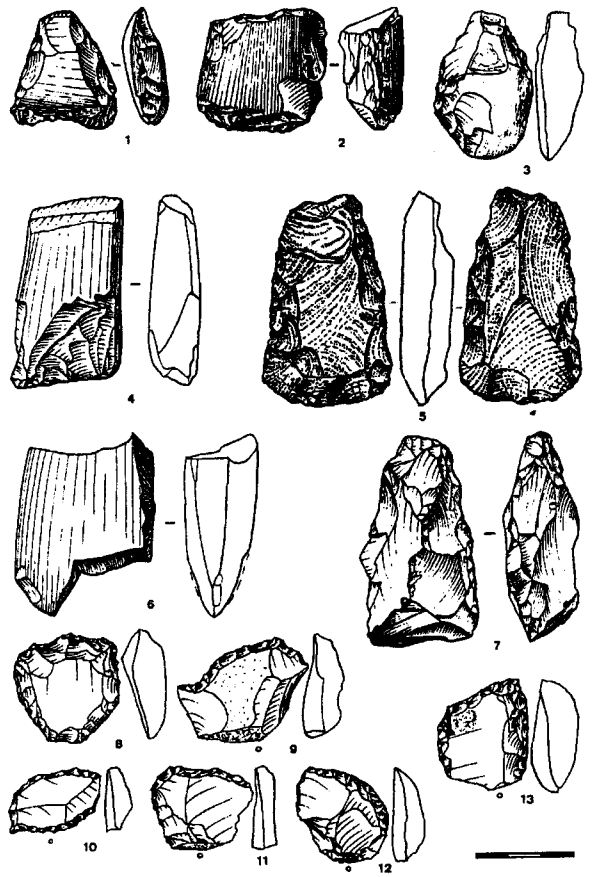

Fig. 4. Zamostye 2: 1–7 – axes and adzes; 8–13 – scrapers (flint)

It is to be concluded that the tradition of flint knapping in the settlement was the same as elsewhere but that the specific features of the available raw material influenced this process and led to the predominance of flakes as functional knapping products.

The arrow-heads in the collection are represented by 30 tanged points made from regular blades (Fig. 3:1-9). These were retouched on the tip and in the pedoncule part on both the ventral and dorsal faces. As a rule, the dorsal face was trimmed by semiabrupt retouch white the ventral by flat retouch (Fig.). Microliths are absent.

The retouched blades and sections of such blades (14,5% of all the stone tools), should also be referred to this category of finds. The use-wear analysis shows that most of these implements have been used as inserts and had traces of meat and bone working (Fig. 3: 10–12).

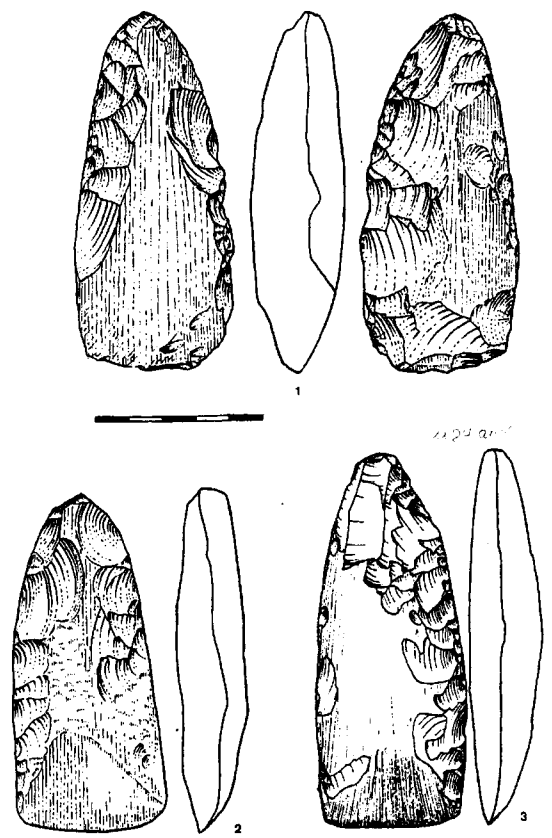

Fig. 5. Zamostye 2: adzes (flint)

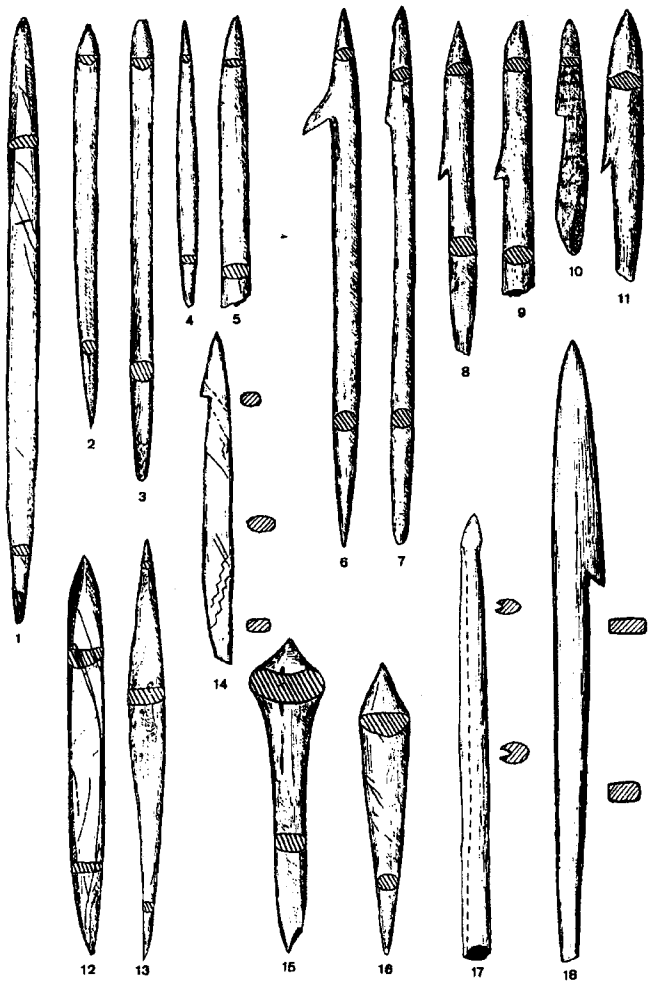

Fig. 6. Zamostye 2: arrow-points (bone)

Among the stone tools, scrapers on flakes are by far the most predominant category, comprising 54% of all the stone tool finds (Fig. 3: 13–18; 4: 8–13). They were made by abrupt edge retouching. It should be noted that this category does not show into clear typological groups. The technique of its making is casual in character, and a striving for maximum edge retouching is apparent leading to a large diversity of scrapers with scraping-edge along the parent edge flake.

This group may be roughly divided into end-scrapers, side-scrapers, and circular scrapers, but most of these tools can be characterised as scrapers of the scrobach variety.

Burins. These implements are fewer than scrapers, accounting for 7% of all the stone tools. There are no clear typological groups among these tools either. Most of the burins present a large diversity in terms of parent flake, and the burin has been removed from any convenient platform.

Awls were also made from any kind of flakes. We can distinguish a large group of shouldered borers with strong traces of hard material working (bone, wood). Altogether, 44 specimens were found.

Axes and adzes. These tools amounted to 6% of all the stone tools. They occurred in two varieties, one triangular in shape and massive in size. These tools have subtriangular form, and in each the working edge was formed by striking flakes transversely from both faces. About half of these tools had one or both faces polished, in particular on the working-edge (Fig. 4: 6; 5). The other variety is represented by small working-edge blades for bone or wood hafting. Sometimes the edge of these tool was also polished (Fig. 4: 1–5, 6). Approximately the same types of polished axes and adzes were collected during ecxavations of Late Mesolithic settlements in the Meschera region (Oka basin).[3]

The last group of stone artifacts consists of pieces of grinding slabs (44 items). As a rule, these finds are of various dimensions, one face of which carries traces of grinding.

BONE INDUSTRY

Of particular interest is the collection of bone tools, which is entirely characteristic of the Late Mesolithic bone industry in the Volga–Oka region.

[3] Kravtsov A. E., Lozovski V. M., Mezoliticheskaya stoyanka Chernaya 1 v Meschere, SA. 1989. 4.

As we mentioned above, the assemblage of bone implements consists of 1700 items. Elk bones were the main material for tool-making. The ancient craftsmen used long tubular, lateral, and metacarpal bones as well as antlers for making the bulk of tools and decorations. Bones of other animals (beaver, roe deer, marten, etc) were also used sometimes.

Bone arrow-heads and harpoon-heads (179 items):

Among the bone projectile points, 27% are intact artifacts. they are mainly needle-shaped arrow-heads. Most projectile points are broken fragments (distal parts – 32%; central parts – 10,5% and tang fragments – 30%).

All bone points can be divided into two main groups: 1. single arrow-heads of various forms and dimentions (100 finds in all – Fig. 6; 7:1). This group can be split into several types: (a) single needle-shaped points with tapered tip and smooth conical tang; (b) needle-shaped points with one barb near a flat tip; (c) needle-shaped points with flat tip and two barbs on a opposite sides; (d) long needle-shaped points with biconical tip; (e) the same points with a slot to hold a series of flint inserts; (f) biconical short points (Fig. 6). 2. The next group consists of harpoon-heads made from long tubular bones of elk (Fig. 7: 2–7). The technique of their making is very interesting: the tubular bones were split along the central axis, and then the tip and two barbs along the edges were cut. The tools' tangs were fashioned with rough large flakes. The rest of the surface was left unprocessed. These implements are large and thick. Altogether, 79 such points were found.

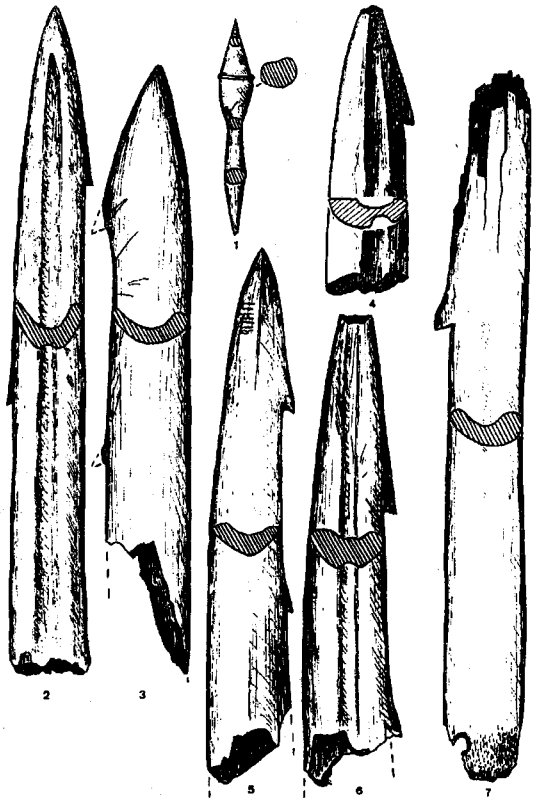

Fig. 7. Zamostye 2: 1 – arrow-point; 2–7 – harpoon-heads (bone)

The separate group of missile weapon consist of just one artifact. It is a long point (length – 248 mm, width – 15-18 mm) with two grooves along the sides (Fig. 8). The point's shape is closely linked to its function: it is a symmetrical tool with two flint edges equal in length and the proximal part shapened to fit a shaft. The two grooves on both edges begin just beneath the tip. Only one insert was preserved in the left groove, and two intact and one small piece of third one in the right groove. However, remains of resin with negatives of the missing inserts indicate that both edges consisted of five inserts in each groove. Use-wear analyses show clear traces of the artifact being used as a missile weapon.

Fig. 8. Zamostye 2: point with flint inserts

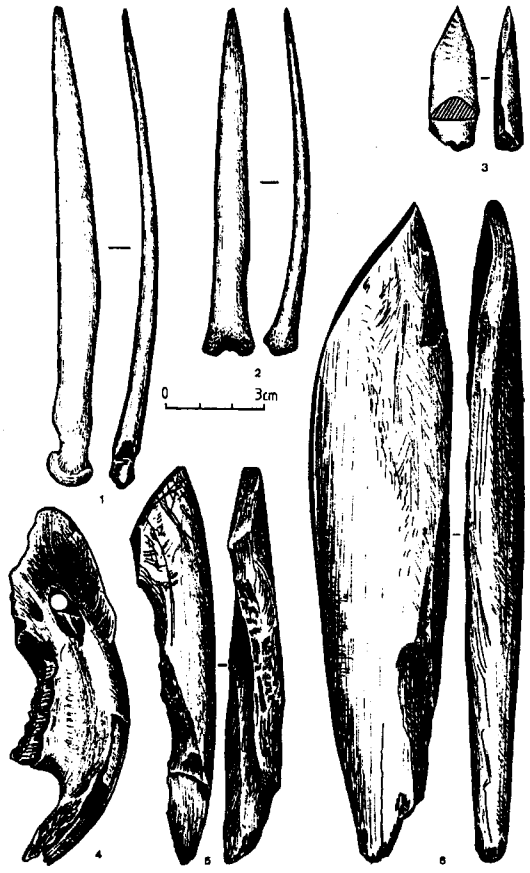

Fig. 9. Zamostye 2: 1–2 – awls; 3, 5, 6 – tools with 45° working edges; 4 – scraper from beaver jaw (bone)

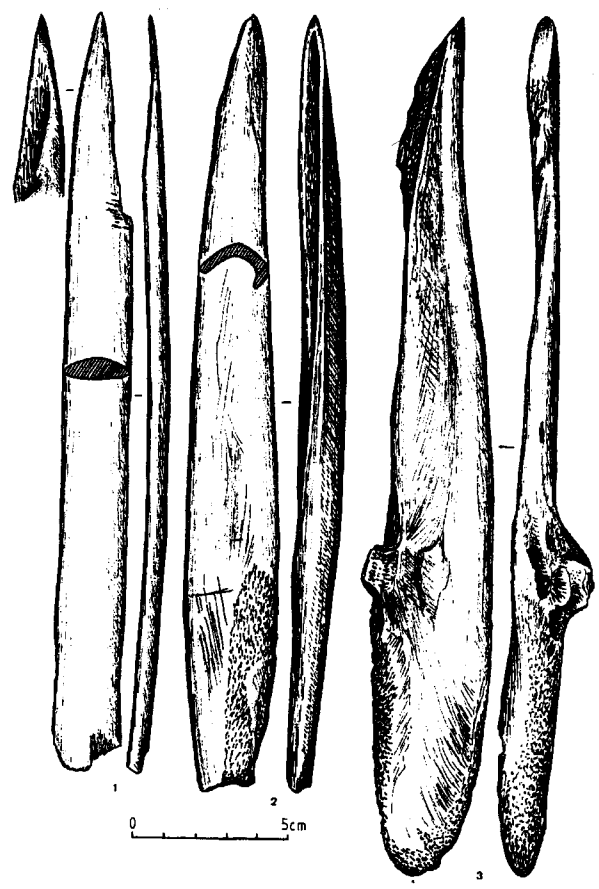

Fig. 10. Zamostye 2: 1, 2 – knives; 3 – tool with 45° working edges

To better determine the origin of this structure of projectile points we ought to analyse the osteological remains found during excavations. This analysis shows a strong predominance of beaver bones (47%), a high percentage of elk and roe deer bones (22%), and the remains of fox and marten are coming on the third (16%). Noteworthy is the absence of bear and wild boar remains. The plentifulness of beaver, elk and small mammals bones is not surprising, because in the beginning of the Atlantic period these animals lived in very large numbers and were the main hunting game of the Mesolithic people. Accordingly we can suggest that arrow-heads were used for hunting beaver and small game, while harpoon-heads for hunting elk and roe deer.

It is to be concluded that the main hunting means of the Mesolithic people were projectiles with bone points, the form of which and technique of making them depended on the principal hunting animals (in particular beaver, elk, and small mammals). Lithic arrow-heads were not widely used for hunting, this being suggested by materials from other Mesolithic sites with bone finds from this region (Sachtysh 9, Ivanovskoye 3 and 7).[4]

Among the bone tools there are three implements from split tubular elk bones whose working edges were tipered from inner and outer faces. Judging from materials from other sites, we think such implements were bone scrapers for skin processing.[5] Very interesting finds of beaver jaws are included in this group. The incisors of these animals were also used by Mesolithic man for skin processing. The specific smoothing traces from scraping indicate this operation. 278 items of these implements, comprising 23 % of all the bone tools, were found (Fig. 9:4).

[4]Krajnov D., Lozovsky V., Kostylova E., Mesoliticheskaya stoyanka Sachtysh 9, Arkheologicheskie pamiatniki Volgo-Okskogo mezhdurechia. Ivanovo. Vyp.3. 1990; Krainov. D. A., Khotinsky N. A., Ivanovskie stoyanki... .

[5] Oshibkina S. V., Mezolit basseina Suchony i Vostochnogo Prionezhya. M. 1983.

The bone industry of the Mesolithic layer of Zamostye 2 is also characterised by bone knives and daggers, which make up 25% of the bone tools assemblage (Fig. 10:1,2). Among these implements, knives from elk ribs are predominant (80% of all knives). In our opinion the function of these tools is the same as of the Eskimo "ulo" fishing knives.[6] Other finds include knives from elk shoulder blades and from tubular elk bones. The find of a dagger with working edges with flint inserts is of great interest in the functional interpretation of bone knives and daggers. The handle of this tool is covered by birch bark and has a small "pit" for wearing. Use-wear analysis shows clear traces of meat and bone working, visible to different degrees on different parts of the flint edges. This allowed us to interpret the tool as a dagger for butchering.

Excavations of Mesolithic layers yielded 106 finds of specific tools with working edges cut at a 45° angle. Use-wear analysis showed that these tools were used only for specific wood-working operations (cutting of birch bark, grooves, etc.). The large number of these implements is very strange and can be considered a specific feature of the bone industry of Zamostye 2 (Fig. 9:3,5,6; 10:3).

Awls are represented by 174 items. As a rule they are made from lateral metacarpal bones (Fig. 9:1,2) of elk and split tubular bones. Another type is represented by the small series of leaf-shaped needles with a small pit in the center of the tool (4 finds). Ethnographic findings show that these tools were used for fishing net-making.

Axes and adzes. There were found 78 antler axes and adzes and 11 chisels made from split tubular bones. All the antler finds were made using the standard technique (Fig. 11; 12) they were cut from the antler tines with thinner palmated part. The head was shaped by the "nibbling" technique, the working edge – by grinding and polishing from both sides. The rest of the surface was not worked and retained the parient structure of the antler. The chisels were fashioned in a similar manner.

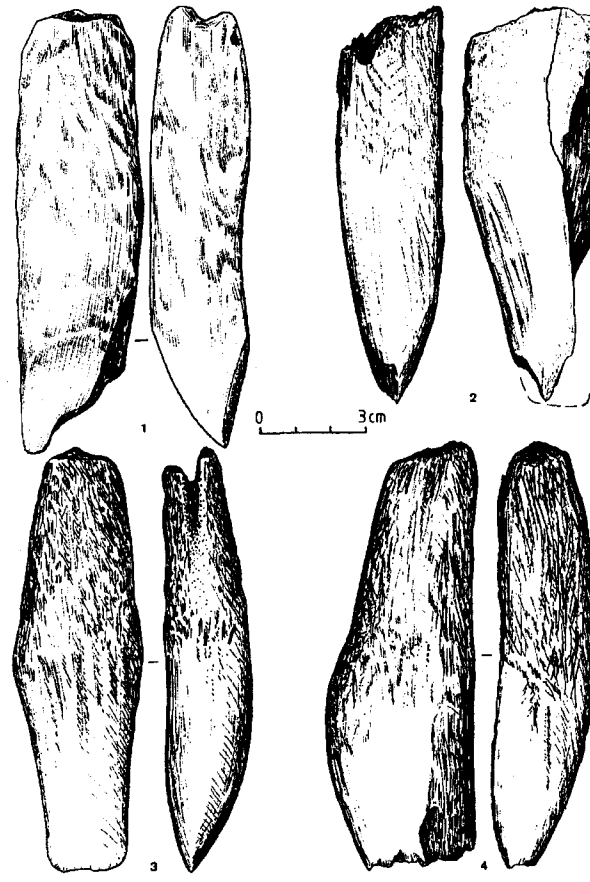

Fig. 11. Zamostye 2: axes and adzes (antler)

The function of the antler axes is not clear. However, the fact that most of these tools have damaged working edges or have been broken along the central axis suggests that they were used widely.

CONCLUSIONS

When compared with Late Mesolithic settlements from this territory, the stone industry from Zamostye 2 turns out to be very similar to materials from other Late Mesolithic sites (Davidkovo,

[6] Bogoraz V. G., Materialnaya Culura Chukchey. M. 1991. P. 144–149; Fayndberg L. A. Ochotniki Amerikanskogo Severa. M. 1991.

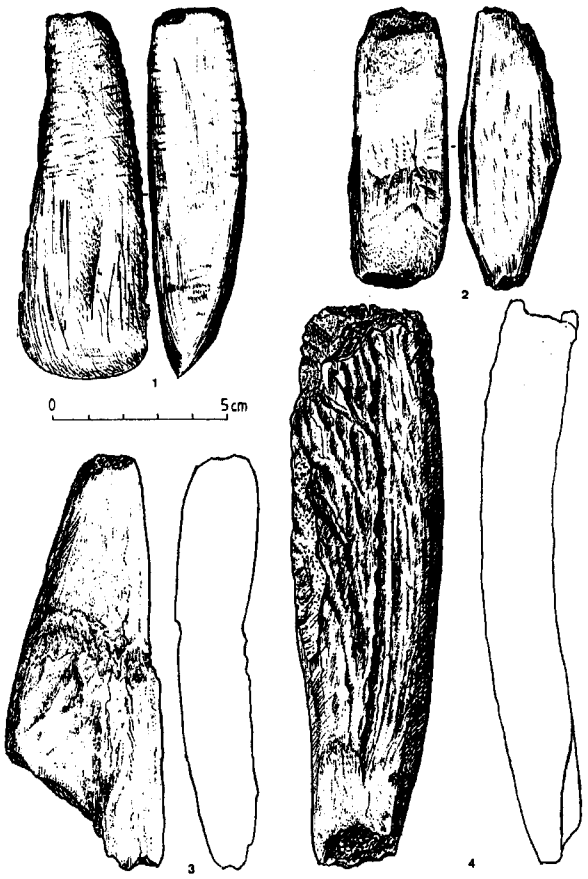

Fig. 12. Zamostye 2: axes and adzes (antler)

Ivanovskoye 3, 7, Chernaya 1).[7] Two main settlements – Davidkovo (Upper Volga basin) and Chernaya 1 (Oka basin) – show the same features of stone industry: flakes and blades production based on keeled core knapping. As in the stone industry of Zamostye 2, there is a strong predominance of scrapers in the tool-kit with the presence of burins of various types. The arrow-points have been made in the same Post-Swiderian tradition. The absence of microliths is a remarkable feature of these collections too. Real differences can be noted only in the percentage of tools on blades – in these collections the percentage is higher. The finds of the series of polished axes and adzes confirm our conclusions.

V. V. Sidorov, who excavated Davidkovo, referred this site to the end of the Mesolithic. However, this conclusion was made on the basis of geological data only. Now, after excavations at Zamostye 2, this date is confirmed.

The materials from Chernaya 1 were dated by a series of C^{14} dates ranging from 8000 to 9000 years B.P., and a series of pollen analyses which dated the settlement to the same period – from second half to the end of the Boreal period. The dates from Zamostye 2 referred the Mesolithic complex to the end of the Boreal – begining of the Atlantic period. So, the occupation period at Zamostye 2 was somewhat later than at the Chernaya 1 site.[8]

The bone industry from Zamostye 2 can, in our oppinion, be compared only with materials from well-known sites in the Baltic and East Onega regions (Pulli, Kunda, Zvidze, Zveinieke 2, Nizhnee Veretye 1).[9] However, all these sites are dated to earlier periods than Zamostye 2 – the Preboreal period (Pulli) and first half of the Boreal period (the others settlements). This fact and the long distances between these regions and Zamostye 2 allow us to point out only the common features of the bone industries.

First of all, it should be noted that the same composition of game animals (beaver, elk, roe-deer, small mammals) defined the same requirements for tool-making. We can also point out very similar types of knives from elk ribs, daggers from elk shoulder-blades, and tools with working edges at 45° angles (Zvidze, Nizhnee Veretye). On these settlements elk antler processing has produced the same types of axes and adzes, but the others sites from the Baltic region feature a different frequency of these implements. A remarkable dissimilarity can be noted in the group of missile weapons, - in complexes from the Baltic region the structure and types of points are different. Barbed points and biconical arrow-heads which are widespread among these sites are

[7] Sidorov V. V., Davidkovskaya stoyanka na reke Jakhrome, SA. 1973. 2; Krainov D. A., Khotinsky N. A., Ivanovskie stoyanki ... ; Kravtsov A. E., Lozovski V. M., Mezoliticheskaya stoyanka Chernaya 1 ... .

[8] Kravtsov A. E., Lozovski V. M., Mezoliticheskaya stoyanka Chernaya 1 ... .

[9] Jaanits K., Die mesolithischen Siedlungsplatze mit Feuersteininventare in Estland, Mesolithicum in Europa, Berlin 1981; Zagorska I.,Zagorskis F., Mesolith Latvii, KSIA, N 149. M.1977; Zagorskis F., Das Spatmesolithikum in Leftland, The Mesolithic in Europe. Warszawa1973.

completely absent in Zamostye 2. The types of harpoon-heads from Zamostye 2 are different than in the Baltic settlements.[10]

Although the excavations at Zamostye 2 gave us the first ever complete set of equipment of a Late Mesolithic population in the Volga–Oka basin, it should be noted that these materials characterize only a short time-span (8500–7500 B.P.) of the Mesolithic in this territory. Further investigations may reveal earlier settlements and allow us to characterise the classic sites of the Butovo culture. However, the finds from Zamostye 2 closely correspond to the Butovo culture in the Volga-Oka region and in the bone industry reveal common features in the Mesolithic period of the forest zone in the European part of Russia.

[10] Jaanits L., Jaanits K., Frühmesolithische Siedlung Pulli, Eestu NSV Teaduste Akademia Toimetised, Koide tihiskon-nateadusted, T. 24, N 1.1975; Jaanits L., Jaanits K., Ausgrabungen der Frühmesolithischen Siedlung von Pulli, Izvestiya AN ESSR. Tallin 1978. N 28. V. 1; Jaanits L., Novie dannie po mesolitu Estonii, MIA. N 126. M.–L..1966; Zagorska I., Ranniy mesolit na territorii Latvii, Izvestiya AN LSSR. 1981. N 2; Oshibkina S. V., Mesolit basseina Suchony...