

The Upper Paleolithic of Northern Asia: Achievements, Problems, and Perspectives. III. Northeastern Siberia and the Russian Far East

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Research into the Upper Paleolithic of northeastern Asia began in the 1940s. Recent work has led to the discovery of numbers of sites, some of them more than 30,000 years old, which are assigned to the D'uktai culture. The material recovered from these sites indicates relationships between the D'uktai culture and other cultures in Europe, Japan, Korea, China, and North America. For the most part, however, these similarities do not result from a spread of cultural traits from Europe into Asia. Instead, most of them reflect local development of the Upper Paleolithic, within both Asia and Europe, out of local Middle Paleolithic industries, which were themselves originally similar in technology and typology.

KEY WORDS: Northern Asia; Northeastern Siberia; Upper Paleolithic; D'uktai culture.

INTRODUCTION

During the last decade, there has been a considerable increase in scholarly interest in the Paleolithic of northeastern Siberia and the Russian Far East. This results from the discovery and study of numerous archaeological sites, some of them with stratified cultural sequences and series of radiocarbon dates (Fig. 1). The material from these now permits us to study the development of the Paleolithic during the last 35,000 years. Also, because of their geographical position,

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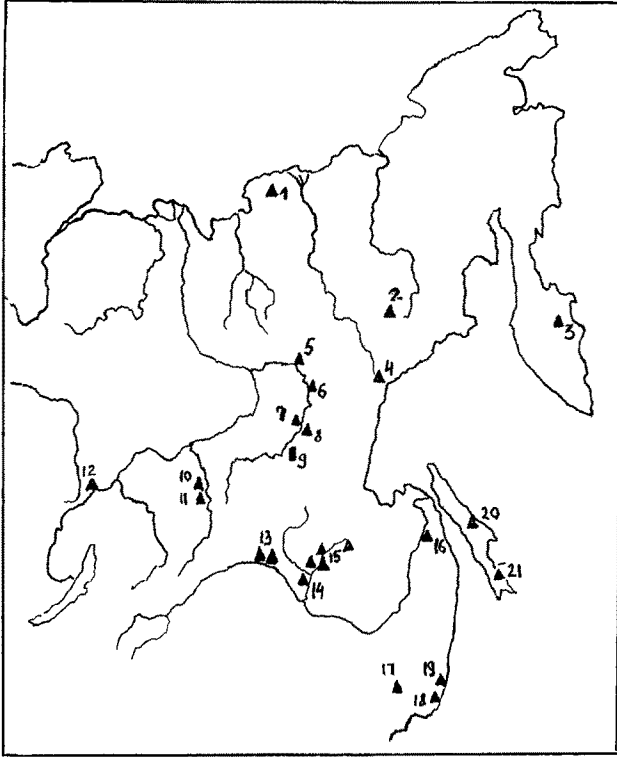


Fig. 1. Upper Paleolithic localities in northeastern Asia and the Russian Far East: (1) Berelekh; (2) Mayorich; (3) Ushki; (4) Kukhtuy; (5) Ikhine I and II; (6) Ezhantsi; (7) Ust'-Mil' II; (8) Verkhnetroitskaya; (9) D'uktai Cave; (10) Kurun II; (11) Noviy Leten; (12) Chastinskaya; (13) Kumari; (14) Novoribachiy; (15) Selemzha sites; (16) Bogorodskoye; (17) Osinovka; (18) Ustinovka; (19) Suvorovo III; (20) Ado-Timovo, Imchin; (21) Sokol.

the sites are directly relevant to the problem of the peopling of America and allow us to examine seriously the interconnections of these industries with those of Japan, Korea, and China (Mochanov, 1977; Derev'anko, 1983; Golubev and Lavrov, 1988; Dikov, 1977, 1979a). Such speculation has previously been only very general in character, in spite of two centuries of archaeological investigation in this region; archaeologists continue to subject "this colossal body of untouched material only to a first pass of the plough" (Okladnikov, 1947, p. 107).

Okladnikov was the first to try to create a complex and polychromatic picture of the ancient history of Yakutia, on the basis of the extremely scanty, local archaeological sites. His study was based mainly on sites in neighboring regions: The Paleolithic of Yakutia itself could be studied only through the

material from one archaeological site, located near the village of Chastinsk at approximately 58°N. Here, stone artifacts were associated with Pleistocene fauna, including wild horse, reindeer, rhinoceros, and arctic fox (Okladnikov, 1955, pp. 35–37). This and other Paleolithic sites found before the 1960s, including Osinovka near the city of Ussuriysk, were discovered as a result of unsystematic surveys.

In the 1960s, archaeological investigations were carried out in the basins of the Rivers Aldan, Kolima, and Indigirka. This period, when the Cis-Lenan archaeological expedition was created, saw a detailed survey of the entire territory of Yakutia and the discovery of a great number of sites with distinct stratigraphy, assigned by Mochanov to the D'uktai Culture. The Geographical Society Cave, Ustinovka, and a series of other sites were also investigated during the same period (Okladnikov, 1966; Tseitlin, 1979).

In the 1970s and 1980s, the area of archaeological study on the River Amur was widened. For instance, in 1982 Okladnikov discovered several sites in the Selemdzha river basin. New sites were also discovered in the Maritime Region (Gladishev, 1986, 1987). The 1970s were notable for the marked qualitative improvement in the study of the preceramic sites of Sakhalin. For the first time, a cultural and chronological developmental sequence was worked out for the Stone Age industries of these territories (Vasil'evskiy, 1979).

The advances in Paleolithic studies of the region led some scholars to attempt to summarize and systematize the data to try to explain the genetic roots of Northern Asiatic cultures. These syntheses were based on the initial existence of bifacial and unifacial technological traditions (Mochanov, 1977) or on the significance of Levallois technology (Vasil'evskiy, 1983).

PALEOLITHIC SITES OF THE CIS-AMUR AREA

Several localities are now known in the Amur river basin, which have yielded pebble tools associated with Levallois cores (Okladnikov and Derev'anko, 1973, pp. 16–17, 28). One such site is Kumari II, where, according to Derev'anko (1983, p. 61), the evolution of the cores can be clearly traced from primitive pebble cores, to Levallois cores and, finally, to protoprismatic forms. The choppers and chopping tools in Kumari II show traces of additional retouching; there are two crude scrapers (*skreblo*; Fig. 2: 1, 3) and a massive semicircular flake with pronounced retouch on its straight edge (Fig. 2: 2).

Kumari III and a cave, 1 km downstream along the Amur from the village of Kumari, are assigned to the final stage of the Upper Paleolithic. At Kumari III, all the artifacts were found on the bank of the river, but they are made, not of river pebbles, but of a black schist brought from elsewhere. The collection includes subprismatic, unifacial cores and epi-Levallois cores (Fig. 2: 4, 6, 7). The tools include choppers and chopping tools, as well as tools made on flakes

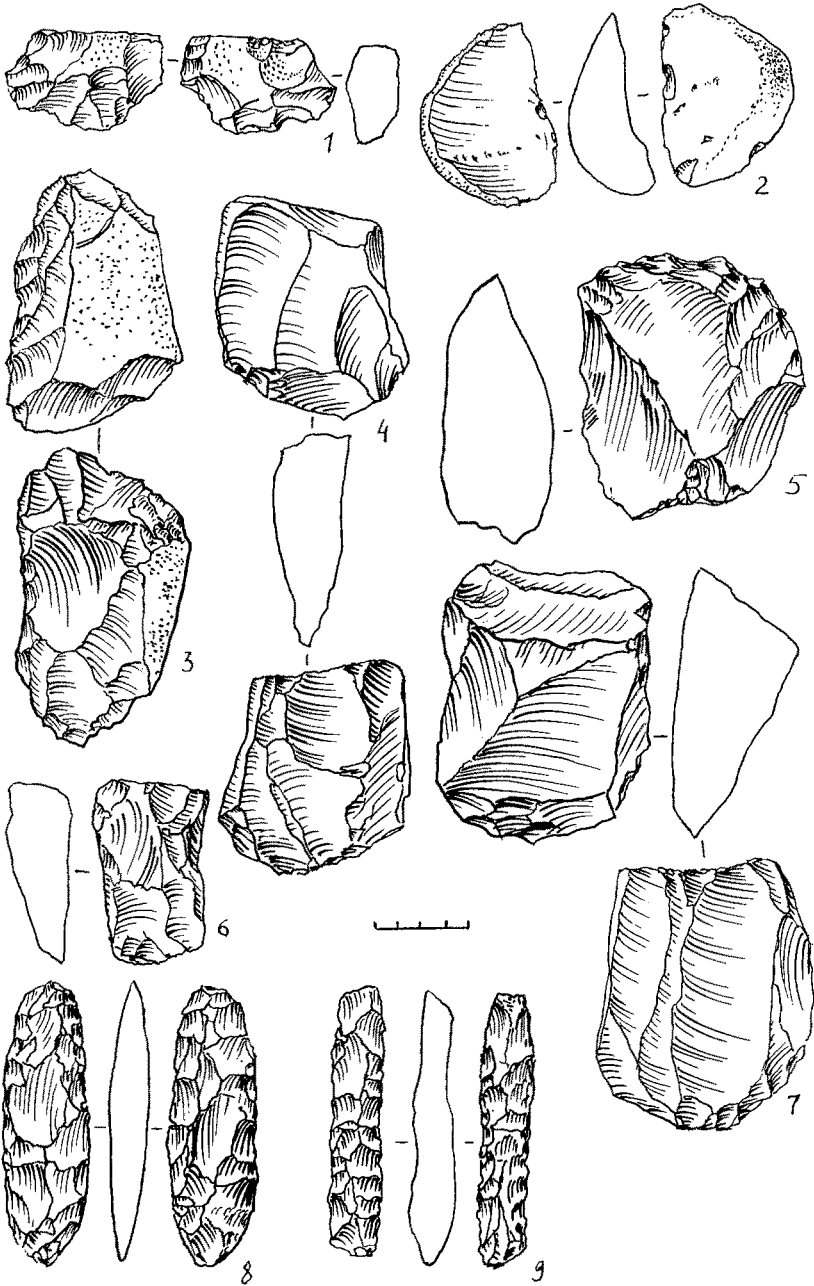


Fig. 2. Artifacts from Kumari II and III: (1, 3) scrapers (*skreblo*); (2) retouched flake; (4, 6, 7) cores; (5) chopper-*skreblo*; (8, 9) bifacially flaked pieces (Derev'anko, 1983). [Provenance: (1-3) Kumari II; (4, 6-9) Kumari III; (5) Osinovka.]

and blades (scrapers, knives, and burins). The bifacially retouched pieces, such as leaf-shaped points and crescentic knives (Fig. 2: 8, 9), are extremely interesting. Artifacts were not numerous in the Kumari cave, but there were several wide flake-blades and a leaf-shaped biface analogous to the finds at Kumari III (Fig. 3).

Another Paleolithic site was discovered in the region of the former village of Novoribachiy on the River Zeya (Derev'anko, 1983, p. 83). The primary flaking technique is represented mainly by single-platform cores made on pebbles. There are boat-shaped and ski-shaped flakes, as well as two preforms (blanks) of wedge-shaped cores. The tools include scrapers (*skreblo* and others), knives, and burins; all of the last are multifaceted symmetrical burins (Fig. 4: 1-6).

In 1982-1984, Derev'anko and Mazin discovered more than a dozen stratified sites in the basin of the Selemdzha, the largest tributary of the Zeya. The sites were on the second to fifth terraces, and all of them had two or three cultural horizons (Derev'anko, 1983, p. 86).

The first locality, Zmeinaya, is on the 17-m terrace of the right bank of the Selemdzha (Mazin, 1987, pp. 164-165) and has three cultural layers. The upper cultural complex yielded flakes, flake-blades, unifacial single-platform cores, denticulated and notched pieces, and medial burins. The second complex contained unifacially retouched flakes, single-platform cores with dihedral platforms, endscrapers, convergent scrapers (*skreblo*), and carinated scrapers, similar to blanks for Gobi cores. In the lower horizon, there were scrapers, convergent scrapers (*skreblo*), and unifacial cores.

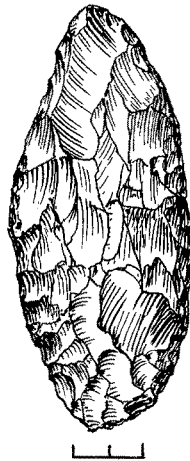


Fig. 3. Biface from Kumari III (Derev'anko, 1983, p. 83).

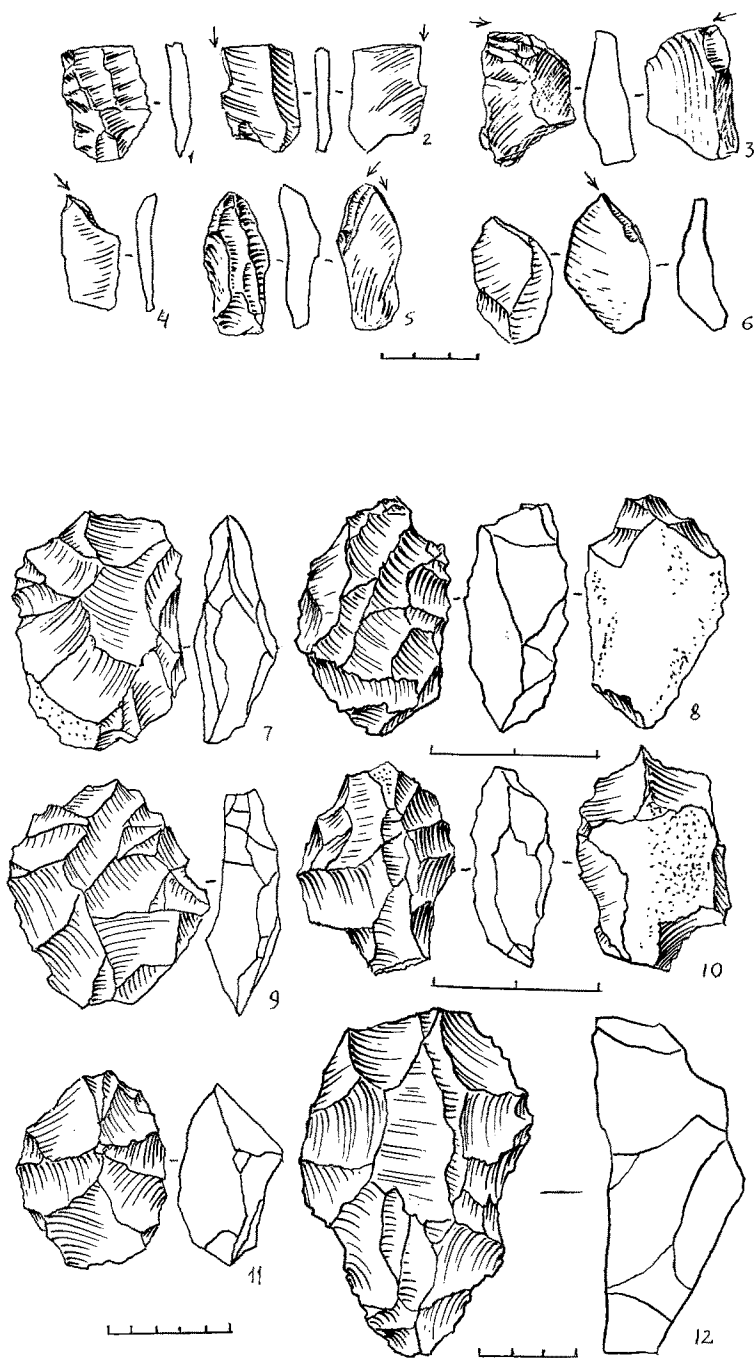


Fig. 4. Artifacts from Novoribachiy (1-6) and Ado-Timovo (7-12): (1-6) burins; (7-12) cores (Derev'anko, 1983; Golubev and Lavrov, 1988).

The second locality, Barkas Hill, is on the right bank of the Selemdzha, 12 km from the mouth of the river. The second cultural layer of Barkas Hill I yielded several types of cores (Derev'anko *et al.*, 1989c, pp. 75–76): Two were struck transversally across the wide end, one of them made using the *ubetsu* technique (Fig. 5: 1). [According to Yoshizaki (Morlan, 1966), the *ubetsu* technique consists of the production of a bifacial foliate, from which large blades are struck along the long axis and microblades are struck transversally across the wide end.] There were also epi-Levallois cores with parallel flaking, numerous amorphous pieces, and one biface (Fig. 5: 3). The third cultural layer yielded a unifacial, single-platform, Levallois core (Fig. 5: 4) and a biface.

Barkas Hill II had single-platform, unifacial, subprismatic, Levallois cores (Fig. 5: 2), as well as cores flaked across the wide end. Bifaces, adzes, and scraper (*skreblo*-) like tools were prevalent in the second cultural layer (Fig. 5: 5, 6).

Ust'-Ul'ma, on a terrace of the right bank of the Selemdzha (Zenin, 1987, pp. 170–171), yielded a chopper, a scraper (*skreblo*), and a burin-scraper (*-skreblo*) from the first layer, while the second layer contained single-platform

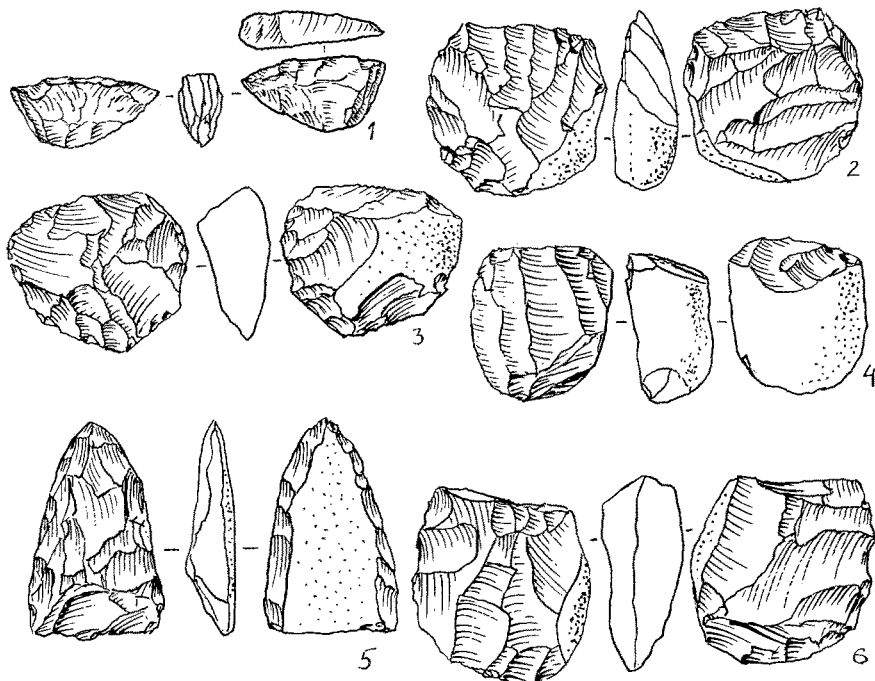


Fig. 5. Artifacts from Barkas Hill: (1, 2, 4) cores; (3, 5, 6) bifaces (Derev'anko *et al.*, 1987). [Provenience: (1, 3) Barkas Hill I, Layer 2; (4) Barkas Hill I, Layer 3; (2, 5, 6) Barkas Hill II, Layer 2.]

pebble-cores, a burin, a sidescraper, an axe, a puncher, a willow-leaf point, a biface, a hammerstone, and retouched flakes.

The second cultural layer of Ust'-Ul'ma has a date of 19,360 B.P. \pm 65 years (SDAS-2619). Its cores are similar to those of the Selemdzha sites; there are also scrapers (including *skreblo*), bifaces, blades, retouched flakes, and notches (Zenin, 1988, 1989). This culture seems to be widespread and is characterized by flaking from the wide end of cores and by the presence of wedge-shaped, prismatic, Levallois cores, scrapers (including *skreblo*), burins, bifaces, and blade tools.

THE STONE AGE OF THE MARITIME REGION

One of the most interesting early Upper Paleolithic sites is Osinovka near the city of Ussuriysk. It was occupied during one of the warm stages of the Kargin interstadial, possibly during its final stage at 30,000–25,000 years ago; The occupation was coeval with the accumulation of the 20- to 25-m erosional terrace (Tseitlin, 1979, p. 242). Choppers and chopping tools are the main tool types, but unlike Early Paleolithic examples, they have additional retouch on their working edges. The cores are heavily worn because of their subsequent use as tools, so they are not easy to classify; some of the scrapers (*skreblo*), for instance, resemble disk cores (Fig. 2: 5). There are also several retouched flakes.

Although its age remains uncertain, the material from the stratified site of Ustinovka I is critical for our understanding of cultural evolution in the Russian Far East in the Late Pleistocene and Early Holocene. There were three cultural layers, of which the first yielded 1210 artifacts. Flakes and blades (829 and 260, respectively) were most numerous, many of them retouched. Cores included wedge-shaped, Levallois (Fig. 6: 1, 6), and subprismatic types (Fig. 6: 4), while the tools included scrapers (*skreblo*) (Fig. 6: 2, 3, 5, 10), other scrapers, knives (Fig. 6: 13), burins (Fig. 6: 7–9, 11), perforators, and a biface.

Material from the second cultural layer consisted mainly of flakes and blades, with fewer tools and cores. The latter were wedge-shaped (Fig. 7: 1), Levallois (Fig. 7: 3), subprismatic, discoidal (Fig. 7: 7), and, in Okladnikov's terminology, "hoof-shaped." Scrapers (*skreblo*) were the most numerous tools (Fig. 7: 4), and other scrapers were varied (Fig. 7: 5, 9). Almost all the knives were made on massive blades and flake-blades, with retouch only on the working edge (Fig. 7: 11, 13). The burins were all angle burins (Fig. 7: 6, 8). The few perforators were made on small flakes, with a spiny projection formed by fine marginal retouch (Fig. 7: 10).

Cultural Layer 3A also produced mainly flakes and blades, some of them retouched. There were core preforms, Levallois cores of various sizes (Fig. 6:

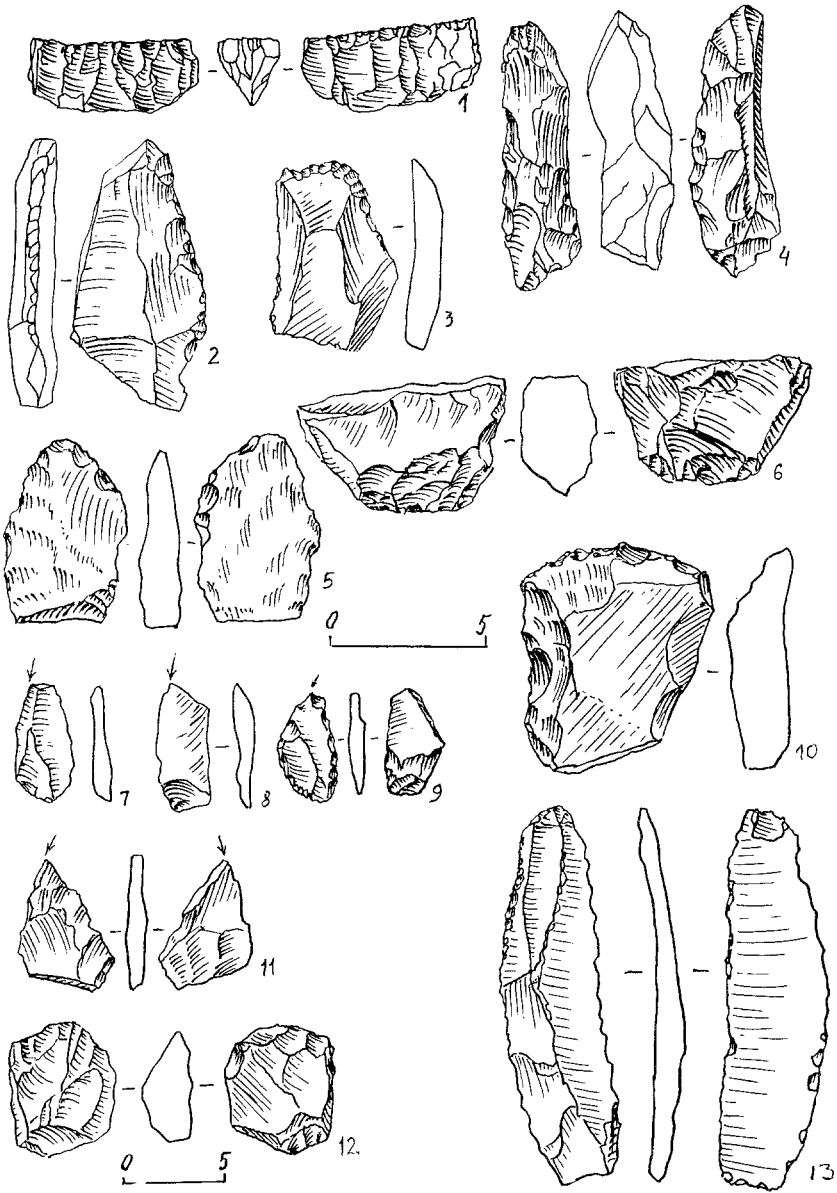


Fig. 6. Artifacts from Ustinovka I: (1, 4, 6, 12) cores; (2, 3, 5, 10) scrapers (*skreblo*); (7-9, 11) burins; (13) knife (Vasil'evskiy and Kashin, 1983). [Provenance: (1-11, 13) Layer 1; (12) Layer 3a.]

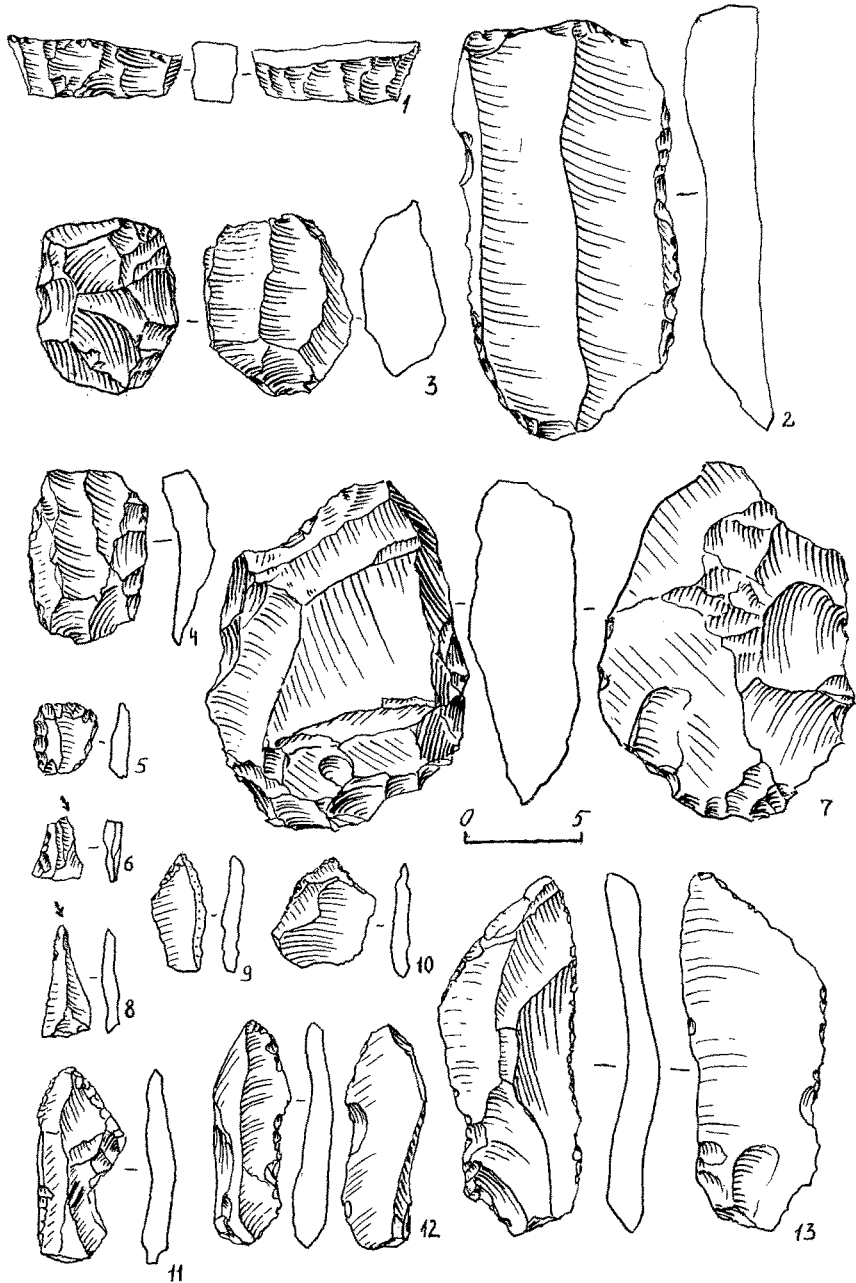


Fig. 7. Artifacts from Ustinovka I: (1, 3, 7) cores; (2, 11-13) knives; (4) scraper (*skreblo*); (5, 9) scrapers; (6, 8) burins; (10) perforator (Vasil'evskiy and Kashin, 1983). [Provenance: (1, 3-13) Layer 2; (2) Layer 1.]

12), disk cores, and prismatic cores. Among the tools were scrapers (*skreblo* and others), *rabots*, knives, and burins. Layer 3B yielded wedge-shaped, Levallois, and prismatic cores, scrapers (*skreblo* and others), *rabots*, knives, burins, a perforator, and a hammerstone (Fig. 8). The cores and tools of Layer 3C were typologically the same as those of the overlying horizons.

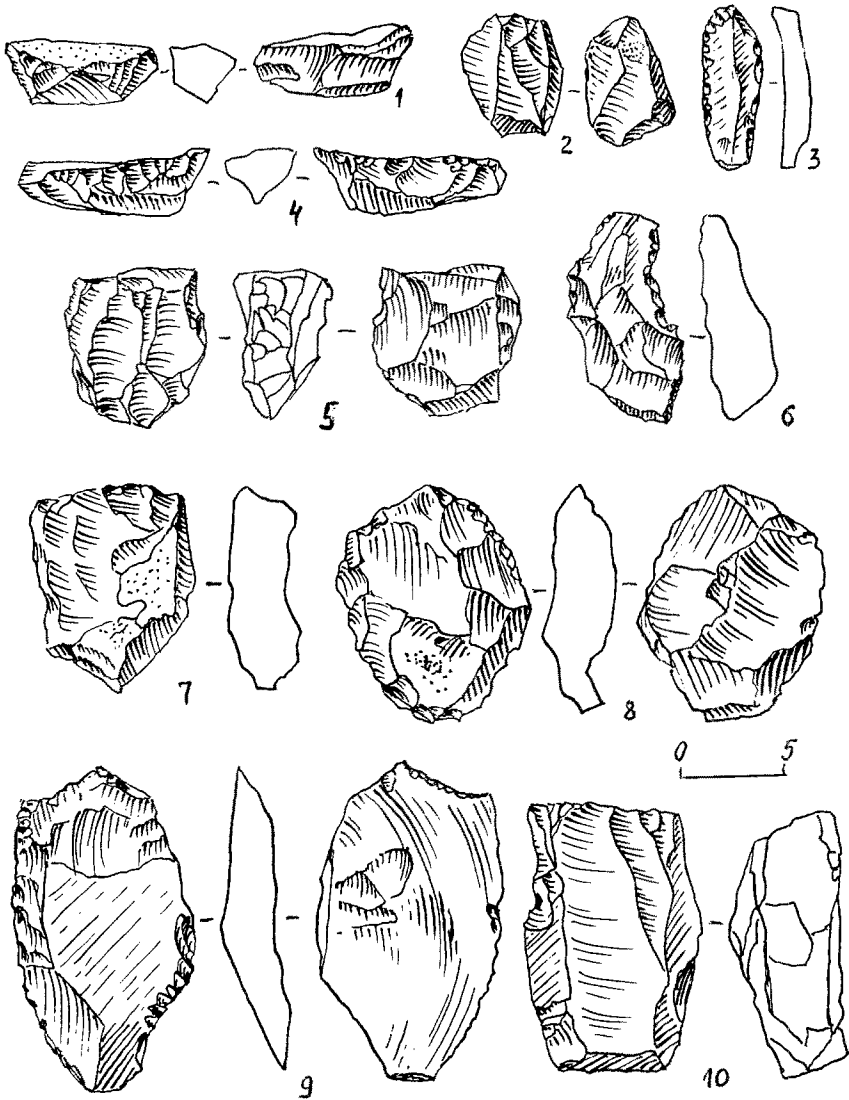


Fig. 8. Artifacts from Layer 3b of Ustinovka I: (1, 2, 4, 5, 10) cores; (3) scraper; (7-9) scrapers (*skreblo*); (6) *rabot* (Vasil'evskiy and Kashin, 1983).

The archaeological material from Ustinovka I has much in common with that from the preceramic complexes of Hokkaido, dated to 17,000–12,000 B.P. The analogies lie not only in typology, but also in the basic *horoko* flaking technique. This technique involves striking massive (>20-cm-long) flakes from boulders and using the ventral faces of these flakes as striking platforms, from which the edges are worked to form boat-shaped tools (Morlan, 1966). The presence of Levallois cores, especially in Layer 3, and archaic scrapers (*skreblo*) is a peculiarity worthy of note (Vasil'evskiy and Kashin, 1983, p. 66). Direct analogies to the material from Ustinovka also occur at Sakhalin, at Kamchatka, and in the Aleutian Islands.

Suvorovo III, which lies not far from Ustinovka II (Vasil'evskiy, 1985), is particularly interesting. There were two cultural layers, of which the first yielded 375 artifacts, including 6 retouched blades, a microblade with blunted retouch, scrapers (*skreblo* and others) (Fig. 9: 6, 9), *rabots* (Fig. 9: 10), knives, and bifacially flaked points (Fig. 9: 2–4). The second cultural horizon produced conical, subprismatic, wedge-shaped, epi-Levallois, and orthogonal cores. The tools were endscrapers (Fig. 9: 7, 8), scrapers (*skreblo*), knives (including some unifacial ones on blades) (Fig. 9: 14), bifaces (Fig. 9: 11, 12), points, and angle (Fig. 9: 13) and transversal (Fig. 9: 5) burins. The excavator considers Suvorovo III to be younger than Layer 1 of Ustinovka I, probably dating to 10,000–8000 years ago.

PRECERAMIC COMPLEXES OF SAKHALIN

The discovery of preceramic complexes on Sakhalin Island is one of the important, recent advances in the archaeology of the Russian Far East. It has been possible to identify several cultural and chronological stages in the development of the Paleolithic and Mesolithic industries.

The first, or Ado-Timovo stage (30,000–25,000 years ago), is represented by material from Ado-Timovo and by pebble tools from Imchin II (Golubev and Lavrov, 1988). The excavators believe that the lithic inventory shows traits typical of the early, possibly Levallois, mainland tradition. Ado-Timovo is on the right bank of the River Tim', 0.5 km northwest of the town of the same name. It lies on the 4- to 5-m terrace, which is made up of alluvial deposits with streaks of clays, sand, loams, and pebbles (Golubev and Lavrov, 1988, p. 56). Most of the cultural material was found at the contact zone with the second (12- to 18-m) terrace. The site yielded Levallois (Fig. 4: 8, 10, 12) and radially flaked, discoidal cores (Fig. 4: 7, 9, 11). The stone tools included scrapers (*skreblo*) made on flakes (Fig. 10: 1, 2), knives made on flakes and blades, many of them bifacially flaked (Fig. 10: 3, 4), points (Fig. 10: 5, 6), and chopping tools (Fig. 10: 7–9).

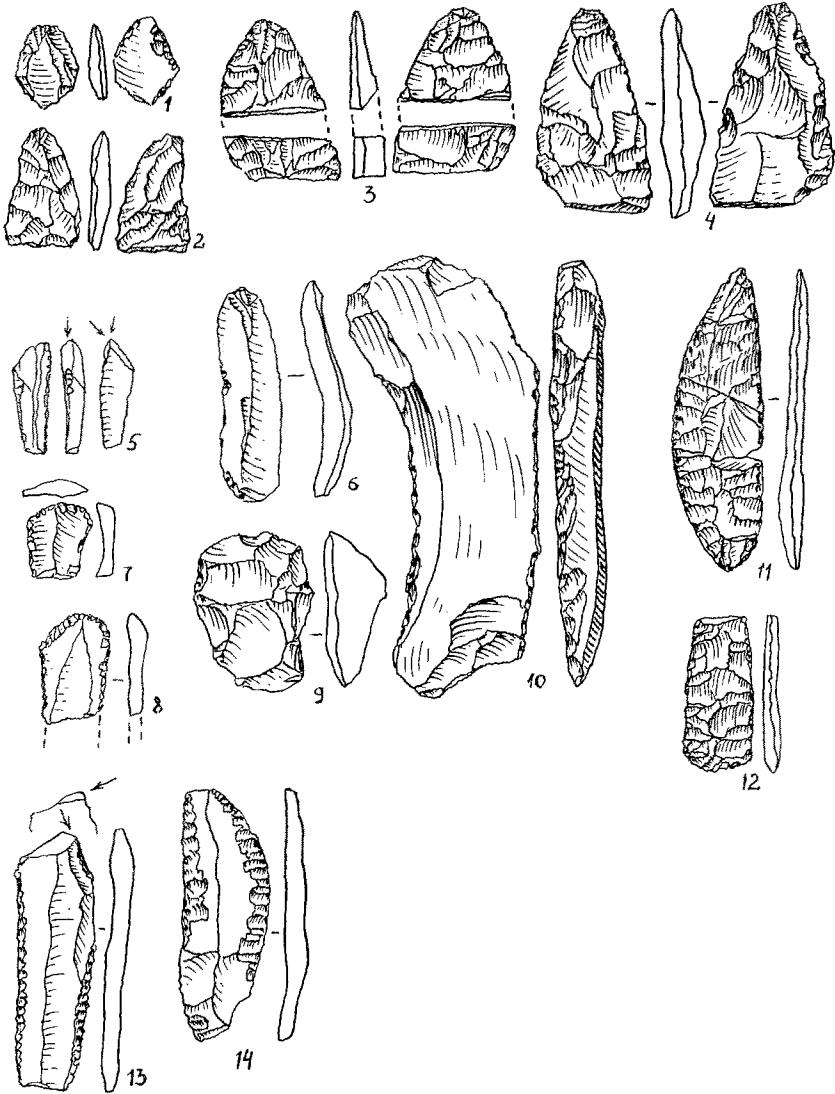


Fig. 9. Artifacts from Suvorovo III: (1) knife; (2-4) bifaces; (5, 13) burins; (6-8) scrapers; (9) scraper (*skreblo*); (10) *rabot*; (11, 12) bifacial knives; (14) unifacially retouched blade (Vasil'evskiy, 1985). [Provenance: (1-4, 6, 9, 10) Layer 1; (5, 7, 8, 11-14) Layer 2.]

The large stone artifacts collected from the surface of Imchin II in 1973 (Fig. 11) look rather archaic. The site is on the 6- to 7-m terrace of the right bank of the River Imchin, 3 km northwest of Nogliki. Excavation of the site permitted assignment of the pebble tools to the lower cultural horizon.

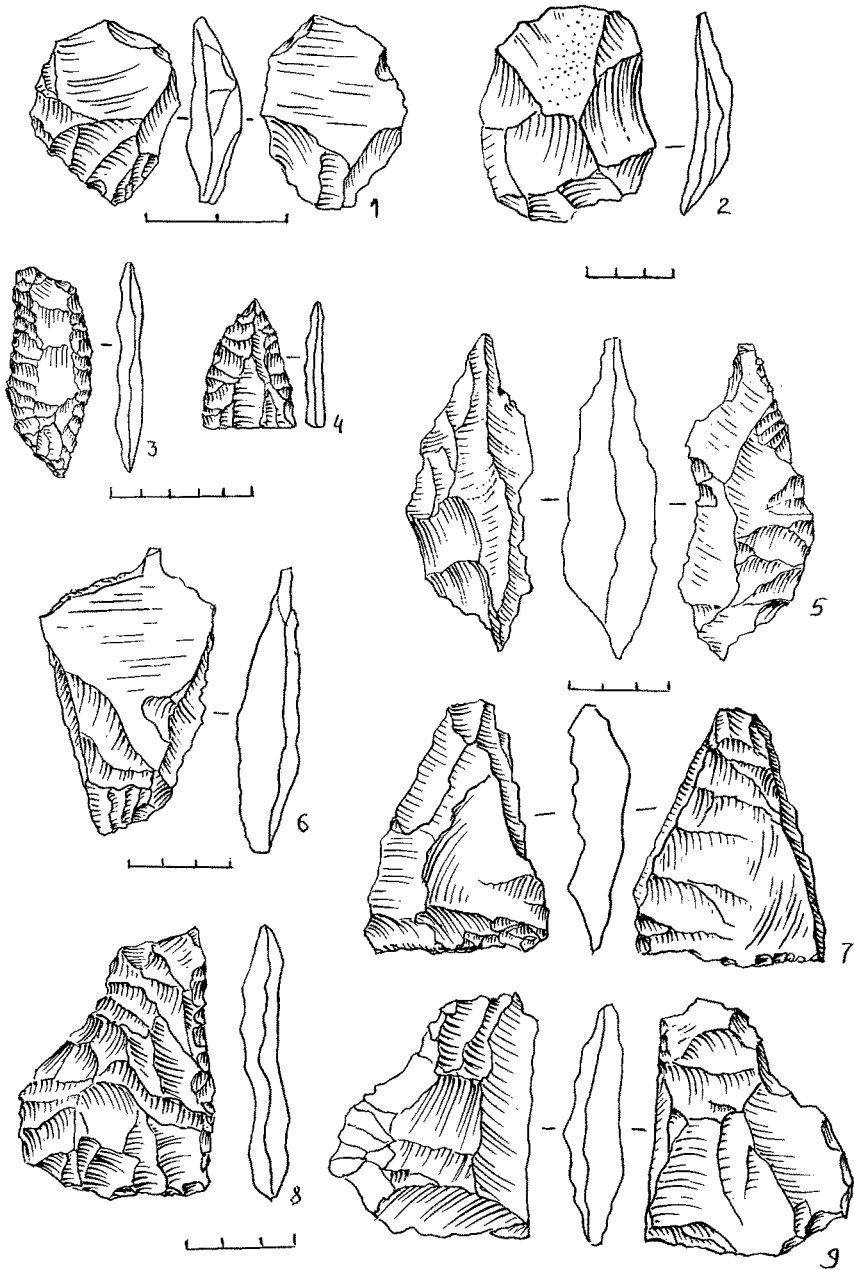


Fig. 10. Artifacts from Ado-Timovo: (1, 2) scrapers (*skreblo*); (3, 4) knives; (5, 6) points; (7-9) chopping tools (Golubev and Lavrov, 1988).

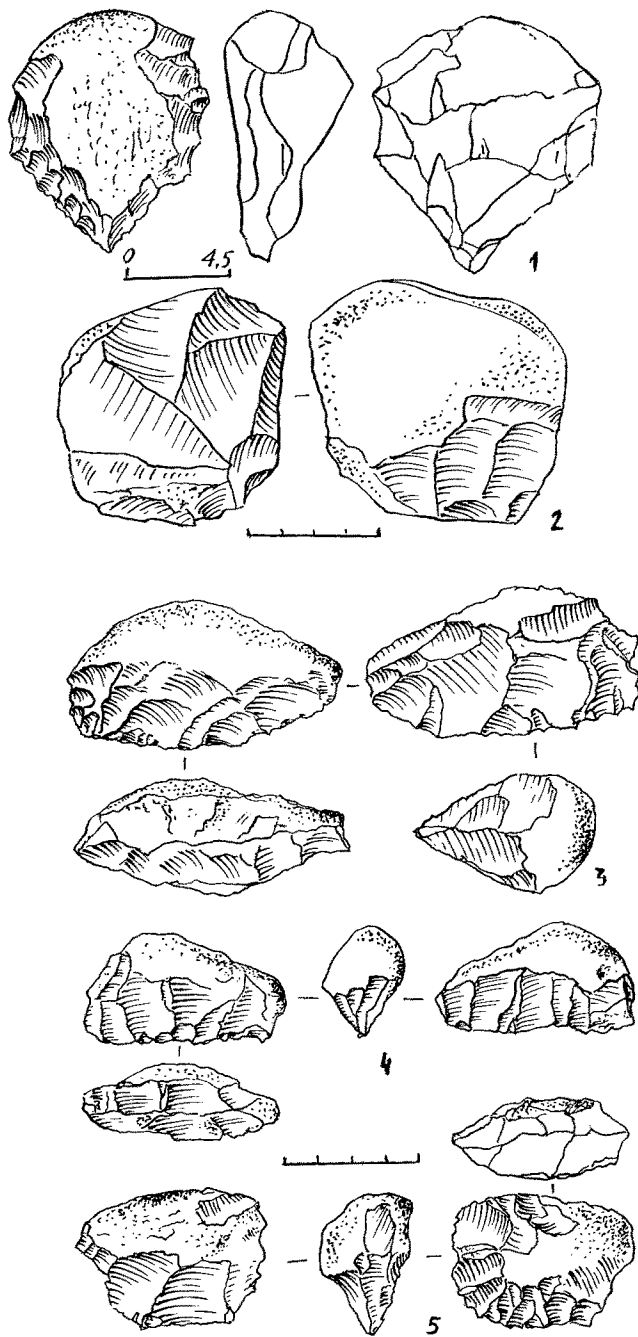


Fig. 11. Surface artifacts from Imchin II: (1, 2) pebble-tools; (3-5) scrapers (*skreblo*) and hand-axes (Golubev and Lavrov, 1988).

The second stage in the development of the Upper Paleolithic is dated to 16,000–12,000 B.P. and is represented by Sokol I and Takoe A. Sites of this type have developed blade industries and correlate well with the early culture of Shirataki, which is probably late Upper Paleolithic (Golubev and Lavrov, 1988, p. 223).

Sokol I is 1.5–2 km east of the settlement of the same name in the Dolinsk region of Sakhalin Island, some 35 km north of the city of Yuzhnosakhalinsk. The cores were wedge-shaped (Fig. 12: 1–3, 9) and made by the *horoko* and *ubetzu* techniques. Scrapers, mainly endscrapers on blades and flake-blades (Fig. 12: 4–6, 8), were the most important tool class. There were also a crescentic scraper (*skreblo*) (Fig. 12: 7), a fragment of a biface (Fig. 12: 1), transversal burins (Fig. 13: 5) (one of them of the *horoko* type), a small series of knives (Fig. 13: 2, 4, 6), points, and numerous (>300) blades (Fig. 13: 7, 8) and flakes (638). Much of this collection lacks precise stratigraphic provenience; the typology suggests a mixture of three strata, containing Early and Late Shirataki and Towarubetsu materials.

During the third stage of the Upper Paleolithic on Sakhalin Island (12,000–10,000 B.P.), there were two cultures: the Imchin in the north (as at Imchin I) and the central-southern Sakhalin culture, represented by the Towarubetsu material at Sokol and by Complex B at Takoe (Golubev and Lavrov, 1988, p. 223).

Several scholars (Vasil'evskiy, 1979; Golubev and Lavrov, 1988) have concluded that the development of the Stone Age cultures of Sakhalin and northern Japan was influenced not only by cultures of the coastal territories of Asia, but also by cultures as far away as Mongolia (Vasil'evskiy, 1979, p. 79). On the mainland, the closest analogies are in the material from Ustinovka in the Maritime Region. Vasil'evskiy argues that such analogies are characteristic of the early influence of the Paleolithic cultures of continental Asia.

THE PALEOLITHIC SITES OF OLEKMA

Recent discoveries of stratified sites have made possible the periodization (from Stone Age to Early Iron Age) of the prehistory of the Olekma river basin (Alexeev, 1987; Cherosov, 1988; Mochanov *et al.*, 1983). All the Stone Age sites (Kurung II, Noviy Leten I and II, Malaya Dzhikimda) fall within the D'uktai culture.

Kurung II, discovered by Alexeev and Zikov in 1975, is on the left bank of the Olekma, 135 km southwest of the mouth of the Kurung (Alexeev, 1987, p. 30); the site lies on a promontory of the first (lowest) terrace of the Olekma. The Late Paleolithic material was from the lower (6) cultural layer and consisted predominantly of flakes (73.2%) and blades (22.6%). Cores included wedge-shaped and discoidal forms (Fig. 14: 5, 9, 11); the latter, although termed

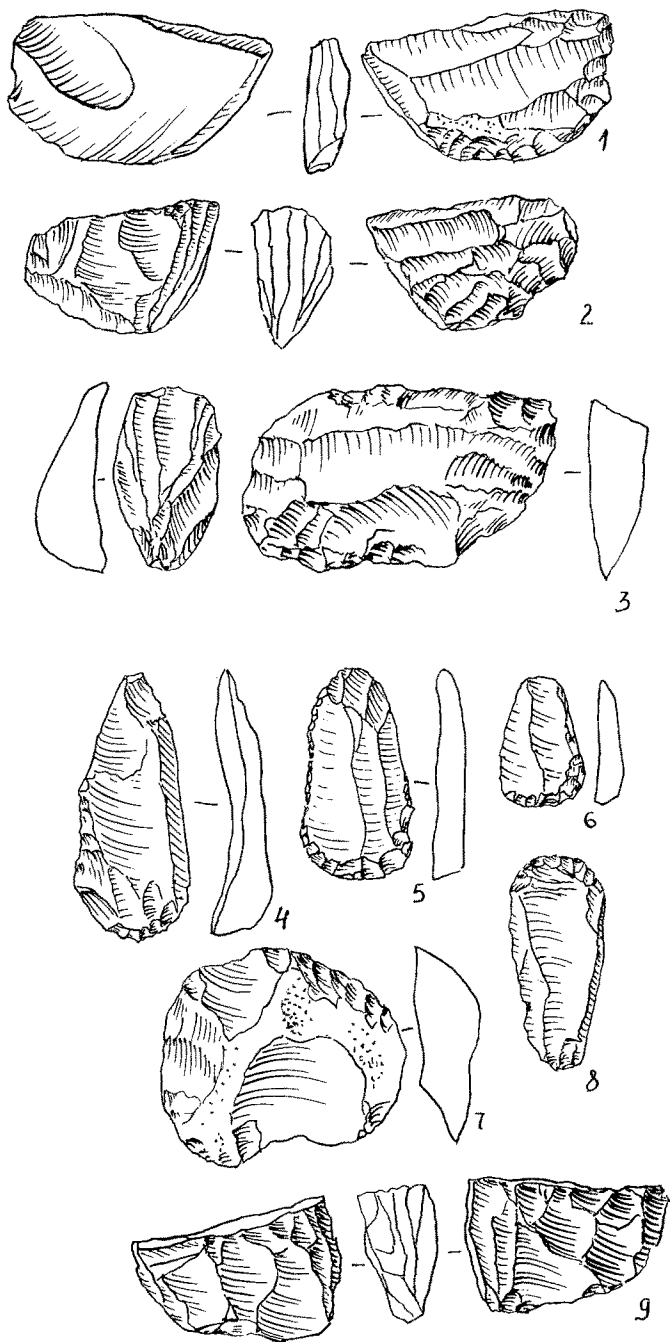


Fig. 12. Artifacts from Sokol I: (1-3, 9) cores; (4-6, 8) scrapers; (7) scraper (*skreblo*) (Golubev and Lavrov, 1988).

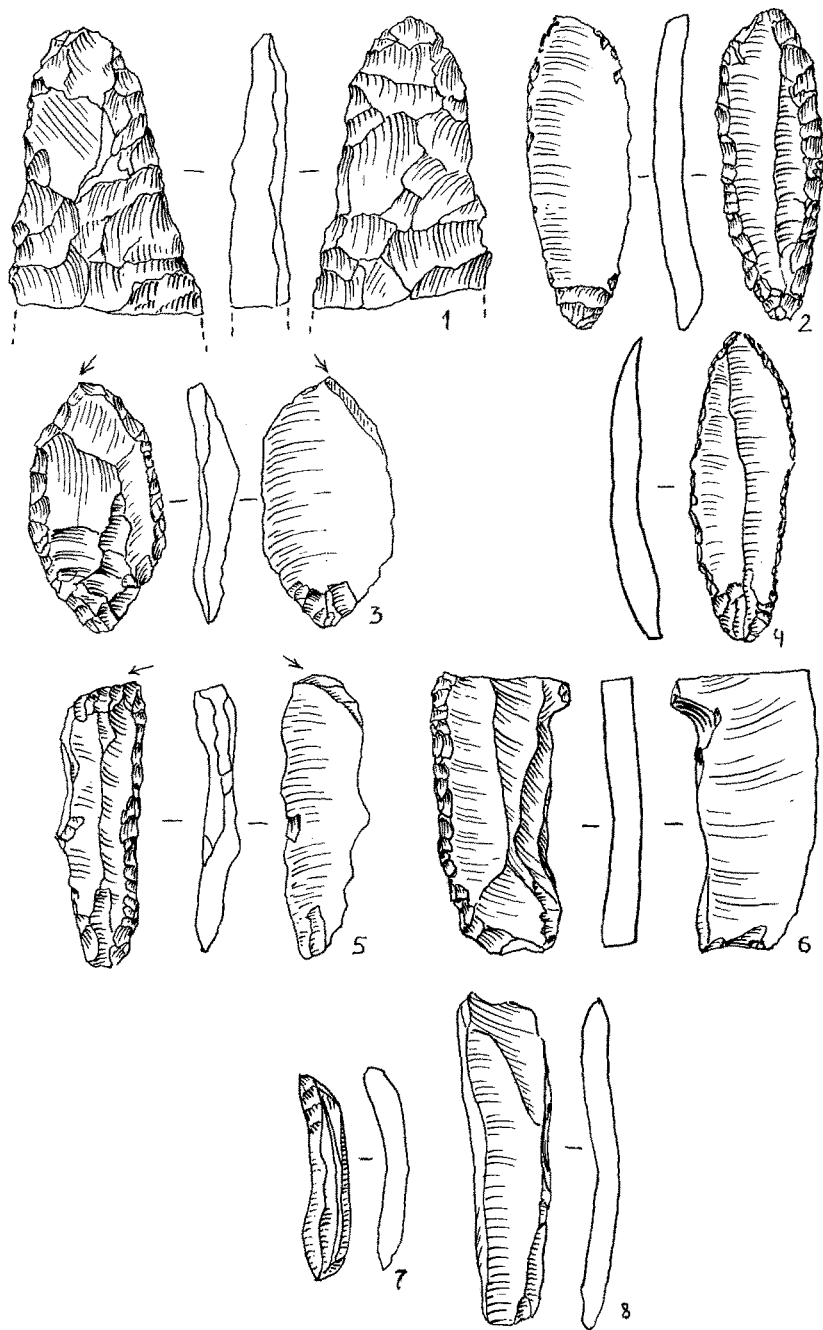


Fig. 13. Artifacts from Sokol I: (1) biface; (2, 4, 6) knives; (3, 5) burins; (7, 8) obsidian blades (Golubev and Lavrov, 1988).

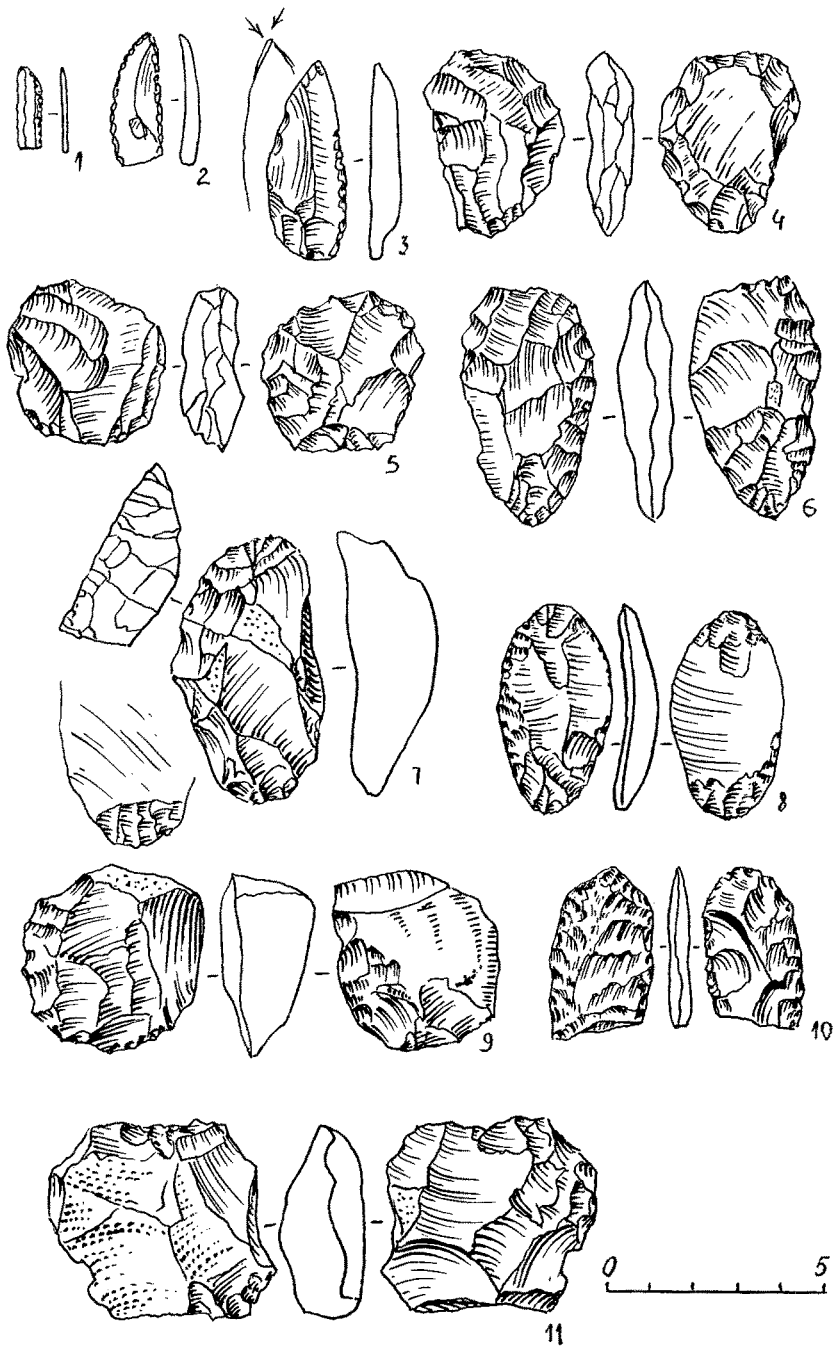


Fig. 14. Artifacts from Kurung II: (1, 2) retouched bladelets; (3) burin; (4, 6, 8, 10) bifaces; (5, 9, 11) disk cores; (7) scraper (Alexeev, 1987).

discooidal, actually have faceting. The tool kit consisted of scrapers (Fig. 14: 7), retouched bladelets (Fig. 14: 1, 2), burins (Fig. 14: 3), and bifaces (Fig. 14: 4, 6, 8, 10), among which Alexeev (1987, p. 37), mentions knives and points, although some of them could be scrapers (*skreblo*).

Noviy Leten II is also on the left bank of the Olekma, on a promontory in the mouth of the River Noviy Leten. It was discovered in 1970 by Arkhipov and investigated by him in 1971–1972 and by Alexeev from 1974 onward. The site yielded Gobi and wedge-shaped cores (Fig. 15: 1–8), bifaces (Fig. 15: 9, 10), and endscrapers on flakes. Alexeev considers the artifacts to be Paleolithic, since the cultural layers (as also at Kurung II) are in alluvial deposits dating to the end of the Late Pleistocene. The artifacts themselves are indisputably related to the D'uktai culture.

The discovery and identification of the D'uktai culture were the result of many years of wide-ranging research by Mochanov (1977). This outstanding scholar discovered a series of complex archaeological sites with cultural horizons containing numerous faunal remains, charcoal and flaked stone, and radiocarbon ages ranging from 35,000 to 10,000 B.P. The sites discovered by Mochanov are particularly important because they occur in very different geological and geomorphological settings. The earliest ones (Ezhantsi, Ust'Mil' II, and Ikhine II) lie in the lower and middle parts of the alluvium of the third (18- to 20-m) terrace; absolute dates for the terrace are 35,000–33,000 B.P. The younger cultural horizons of these sites (31,000–23,000 B.P.) are also in alluvium. The Nizhne and Verkhnetroitskaya sites date to 18,000–17,000 B.P. and are in the alluvium of the 12- to 13-m terrace. The youngest D'uktai cultural horizons date to 12,000 B.P. D'uktai Cave (dated to 14,000–12,000 B.P.) is the type site of the culture. Tseitlin (1979, p. 238) assigns the Paleolithic layers of D'uktai Cave to the second half of the Sartan Glaciation.

During the last decade, there have been some suggestions that the earliest D'uktai culture sites might be younger than had been thought. This was first proposed by Okladnikov (1981), who was followed by Abramova (1989). Mochanov accurately observed that the latter's views "indicate that, in determining the age of the Paleolithic sites, she still attaches most significance to the typology of stone tools, and ignores or regards as secondary all the other dating indicators—stratigraphy, fauna, flora and radiocarbon dates" (Mochanov *et al.*, 1983, p. 13). For example, when discussing the radiocarbon dates, Abramova (1989) has suggested that there might be occasional fragments of wood samples in the Paleolithic layers of Ezhantsi and Ust'-Mil' II. She does not consider the marked lithological differences between layers, their different absolute dates (Tseitlin, 1979, p. 227, Fig. 57), and the humified areas of Layer 4, observed by Mochanov and Tseitlin, which are probably traces of the Late Kargin soil and thus accord with the date of 23,500 B.P. \pm 500 years (Le-999) from the overlying layer. This conclusion is also supported by the spore and pollen anal-

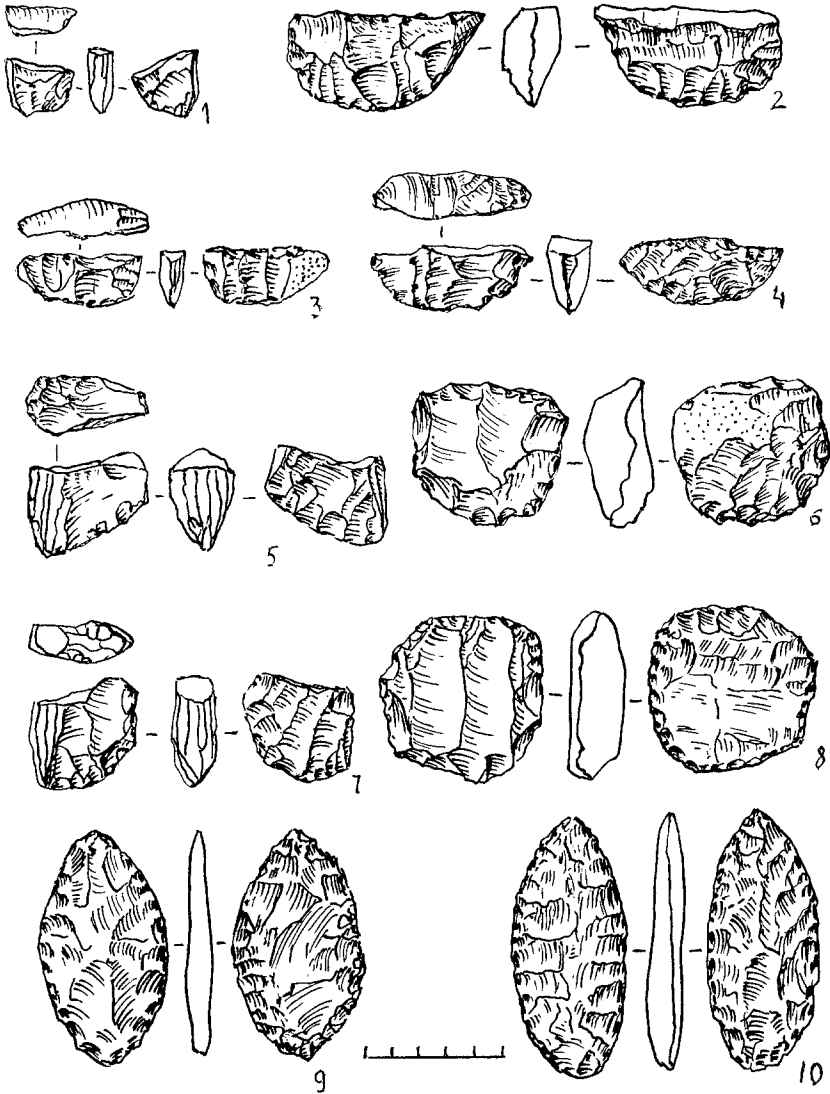


Fig. 15. Artifacts from Noviy Leten II: (1-8) cores; (9, 10) bifaces (Mochanov, 1977).

yses for Layer 4, which indicate the same paleoclimate as outlined by Kind (1974) for the Kargin interglacial complex and also agree with Tseitlin's idea of the structure of the third terrace of the Aldan. The spore and pollen data (Tomskaya and Savinova, 1975) show that the harshest climatic conditions fell within the interval 33,000-30,000 years ago, when the frequency of *Bottrichium*

spores sharply increased. The most favorable climatic indicators among the pollen and spores were for the lower halves of Layers 4 and 3. Abramova also claims that the fauna at Ezhantsi Site is the same as at the other sites, differing only in the presence of woolly rhinoceros (1989, p. 230). However, she ignores Khol'ushkin's statistical analysis of the faunal remains from D'uktai Cave, Verkhnetroitskaya Cave, Ikhine II (Layer 2a, b, c, d), and Ikhine I (Layer 2), which showed that they were significantly different (Khol'ushkin, 1981, p. 37).

Instead, Abramova tries to demonstrate that the Aldan sites are late because they have a wide variety of wedge-shaped cores, but she does not take into consideration that the technique of flaking cores across their thick end was used in early times. For instance, there are such cores and multifaceted burins resembling wedge-shaped cores at Kara-Bom.

Since the material of the D'uktai culture is well-known in the literature, we give only a brief description of it here. D'uktai Cave was discovered by Mochanov in 1967. An area of 317 m² was excavated inside the cave and in front of it. The stone artifacts were mostly production waste. Wedge-shaped cores predominated (Fig. 16: 1–3), but there were also single-platform and radially flaked types. The most typical and characteristic tools were bifaces (Fig. 16: 4, 5). Burins were represented by several types (Fig. 16: 6), including multifaceted. Scrapers (*skreblo*) were not numerous and were of two varieties: unifacial with a thick end and transversal with a straight working edge. There were also knives and scrapers made on blades and flakes, some of which were inserted into grooved bone hafts.

The collection from Ezhantsi included wedge-shaped (Fig. 16: 9, 10), subprismatic, and tortoise cores, burins (Fig. 17: 2–4), scrapers (Fig. 17: 1) (some of them *skreblo*), perforators, and bifaces (Fig. 17: 5). The peculiarity of this assemblage, in Mochanov's opinion, lies in the predominance (70%) of the various burins.

Similar stone industries were also found at the other D'uktai sites recognized by Mochanov. All the Aldan sites used a prismatic flaking technique, reflected in the regular shape of the blades and microblades and in the wedge-shaped cores. Abramova (1989) is unable to see any evolution within the D'uktai culture. However, Mochanov considers that the earliest sites are characterized by an association of large, subprismatic pebble cores, similar to partially finished choppers, with small wedge-shaped cores. The latter are sometimes indistinguishable from multifaceted medial and lateral burins in shape, size, and technique. Isolated pebble-scrapers (*skreblo*) occurred at one site (Mochanov, 1977, p. 223).

Ikhine I and II, on the River Aldan, are dated to 30,000–25,000 years. Their cultural affinities are not certain, since the collections from them are small. However, according to Mochanov, the presence at Ikhine I of an elongated wedge-shaped core of the "Gobi type" (Fig. 16: 11) with two retouched edges,

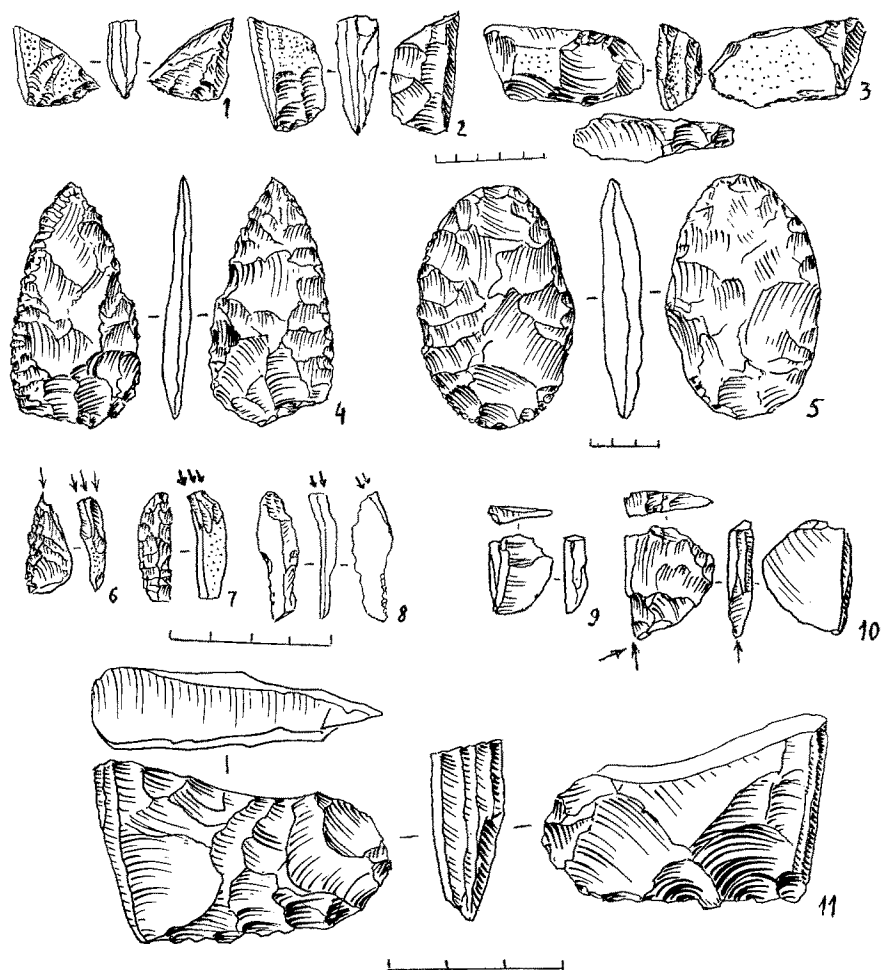


Fig. 16. Artifacts from the Aldan sites: (1-3, 9, 11) cores; (4, 5) bifaces; (6-8, 10) burins (Mochanov, 1977). [Provenience: (1-8) D'uktai Cave (1-5, Layer 7a; 6 and 7, Layer 7b; 8, Layer 8); (9, 10) Ezhantsi; (11) Ikhine I.]

suggests that this and the contemporaneous Ikhine II could be related to the D'uktai culture (Mochanov, 1977, p. 224).

The most complete picture of the D'uktai culture is provided by the archaeological complexes dating to 20,000-18,000 years age. The material from Verkhnetroitskaya indicates that at this time the D'uktai people began to produce bifacially flaked points (Fig. 17: 7). Such points are most common in the final stages of the D'uktai culture along the River Aldan, at Tumulur (Fig. 17: 6-8, 10) and D'uktai Cave.

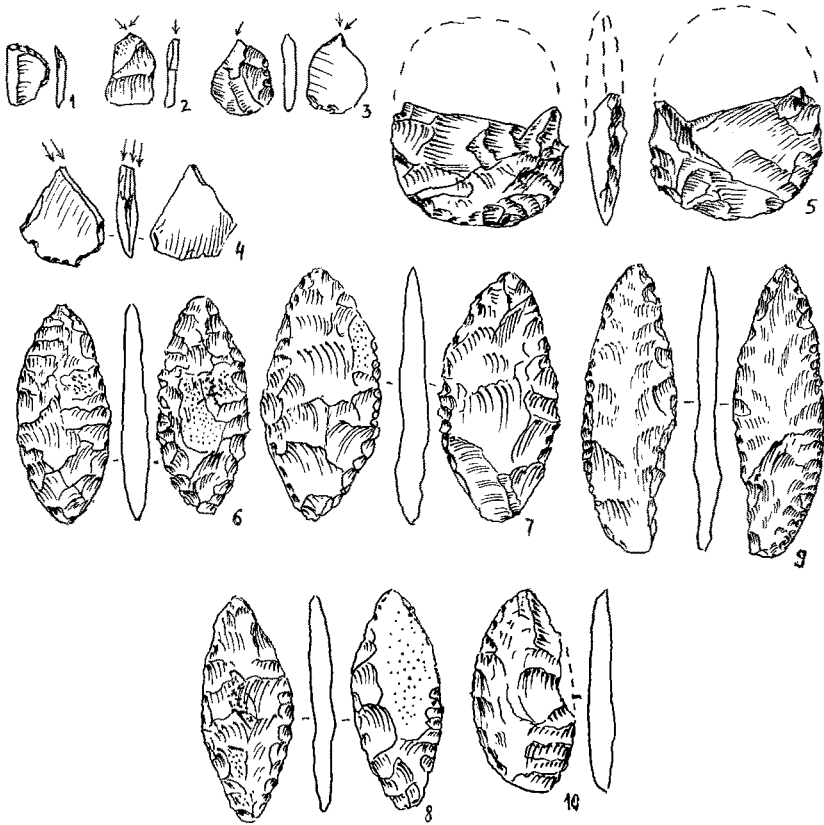


Fig. 17. Artifacts of the D'uktai culture: (1) scraper; (2-4) burins; (5-10) bifaces (Mochanov, 1977). [Provenience: (1-5) Ezhantsi; (6-8, 10) Tumulur; (9) Verkhnetroitskaya.]

Mochanov believes that Berelekh, the northernmost Paleolithic site in Russia, can be assigned to the D'uktai culture. Initial work here was on a mammoth bone "cemetery" and charcoal from the layer above the bone-bearing stratum gave dates of 11,830 B.P. \pm 110 years (LU-147) and 12,240 B.P. \pm 160 years (LU-149). Subsequent research in a nearby area yielded lithic production waste, pendants made of round or oval pebbles, bifacially flaked dart points and a knife (Fig. 18: 1, 2), retouched blades and flakes, and worked bone and ivory.

Mochanov also considers Avdeikha, on the River Vitim, and Kukhtai III, on the northwestern coast of the Okhotsk Sea, to be related to the D'uktai culture (Fig. 18: 3-6). Bifaces from these sites are similar to those of the D'uktai sites on the Aldan in their shape and technique of manufacture.

Several cultural layers of the Ushki sites (in Kamchatka) belong to the final stages of the D'uktai culture (Dikov, 1977, 1979a,b), of which Ushki I is the

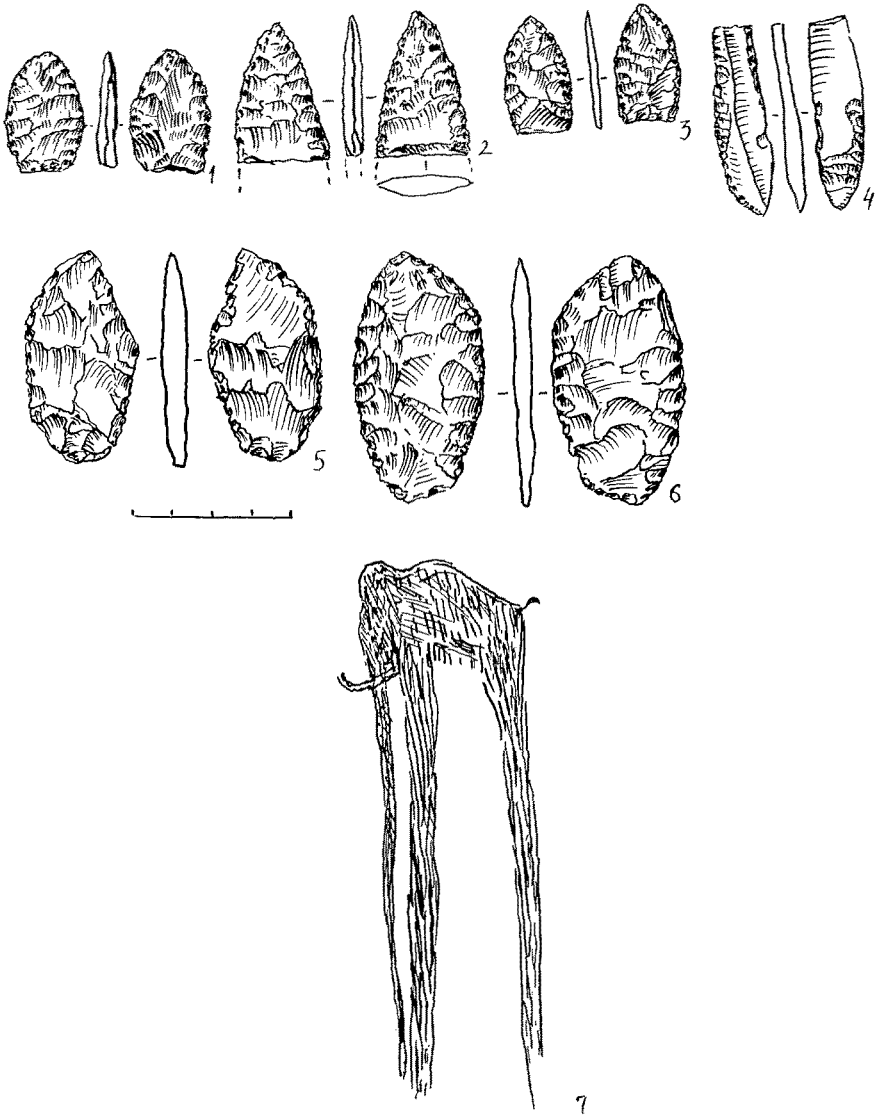


Fig. 18. Artifacts from Berelekh and Kukhtai III: (1-3, 5, 6) bifaces; (4) point; (7) drawing of a mammoth (Mochanov, 1977). [Provenance: (1, 2, 7) Berelekh; (3-6) Kukhtai III.]

most interesting. Layer 7, the earliest, had traces of a living area and hearths. The stone tools included bifacially flaked, stemmed points (Fig. 19: 1-4), leaf-shaped points and fragments (Fig. 19: 6), bifacial knives, scrapers (some of them *skreblo*) (Fig. 19: 7, 8, 10), burins (Fig. 19: 9), and sandstone abraders.

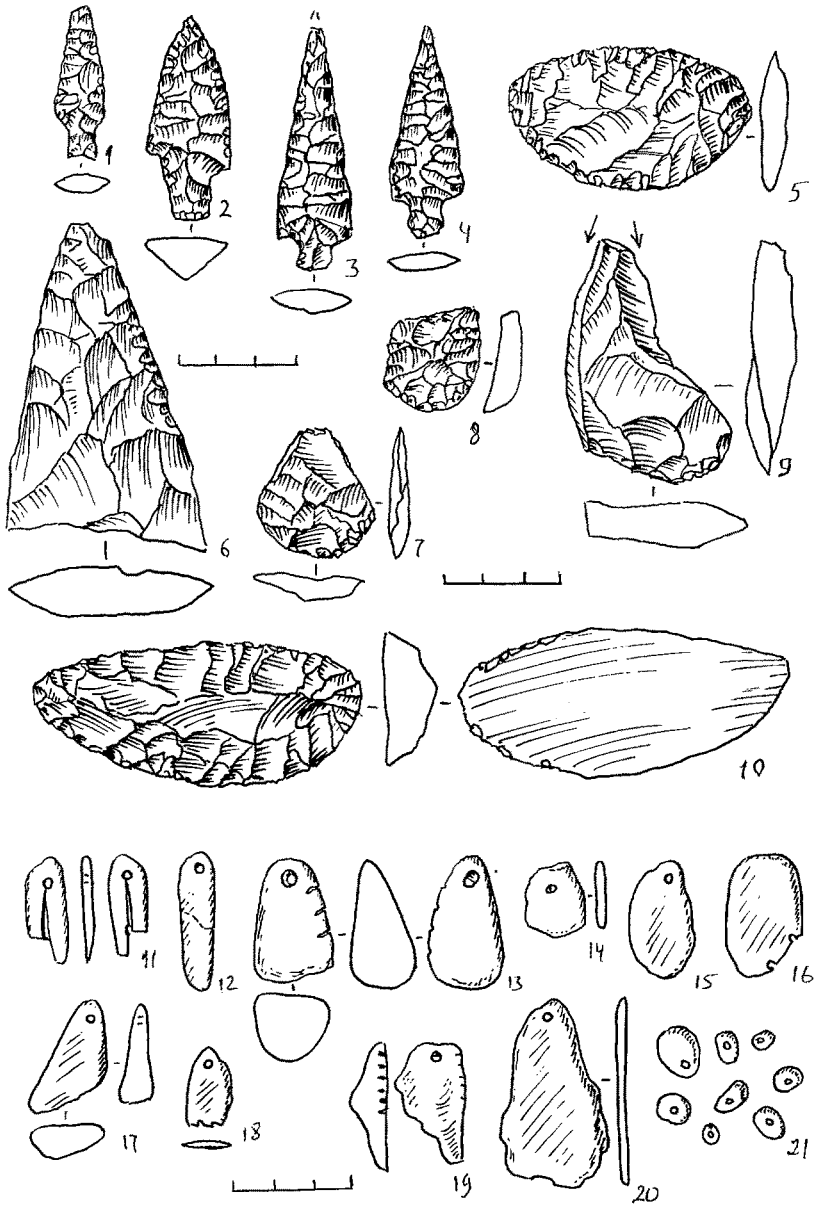


Fig. 19. Artifacts of the early Ushki culture: (1-4) stemmed points; (6) broken point; (7, 8) scrapers; (9) burin; (5, 10) knife; (11-21) stone pendants (Dikov, 1979).

There were also stone pendants and beads of varied types (Fig. 19: 11-21) and a fragment of antler (Dikov, 1979a). A round pit contained a burial, with the bones covered with ocher and beads and burin-shaped points scattered among them. Charcoal from the burial yielded dates of 13,600 B.P. \pm 250 years (GIN-167) and 14,300 B.P. \pm 200 years (GIN-168). Dikov believes that the industry of this layer "represents a Siberian culture of the Stone Age" (1979a, p. 38), a conclusion which remains to be tested by future research. We would note that Russian archaeologists tend to recognize a new culture with the discovery of every new site but must also observe that this is easy to do in the absence of standardized criteria for such recognition.

In Layer 6 of Ushki I, there were 16 dwellings of various types (Fig. 20), some of which contained very small fragments of burnt bone, including fish. The floor of one dwelling yielded a burial of a domesticated dog, and the floor

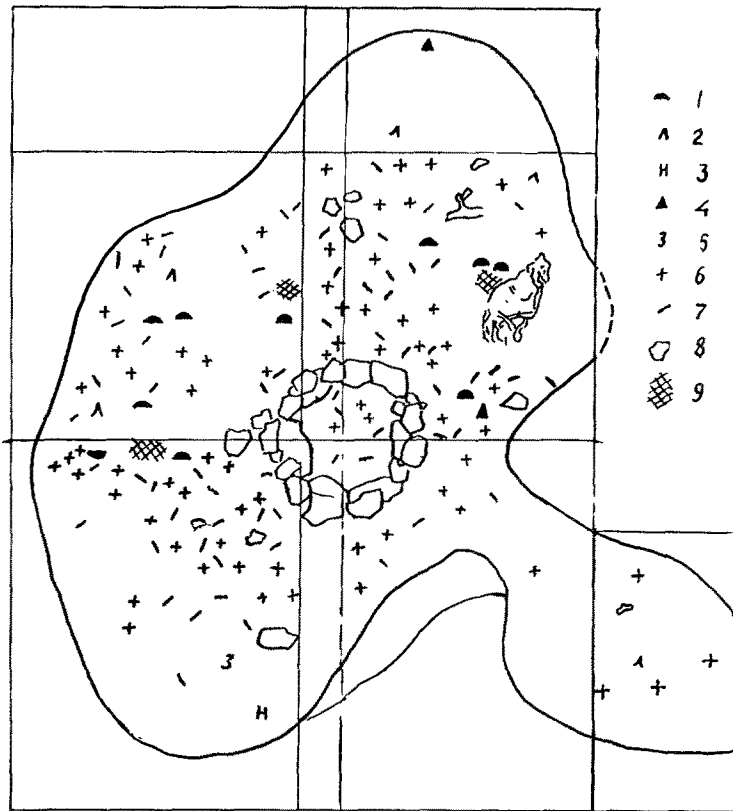


Fig. 20. Middle layer of the Paleolithic dwelling at Ushki (Layer 6) (Dikov, 1979): (1) stone knife; (2) ski-like flake; (3) cores; (4) wedge-shaped core; (5) green stone; (6) flake; (7) blade; (8) sandstone slab; (9) red ocher.

of another had a burial which still remains unidentified. These finds are almost unique: Before the discovery of Ushki I, the only known burial was of a small mammoth at the site of Mal'ta. The faunal remains of Layer 6 included bison, snow sheep, lemming, and horse (Vereshchagin, 1979). Three radiocarbon dates have been obtained on charcoal—10,360 B.P. \pm 350 years (MO-345), 10,760 B.P. \pm 110 years (MAG-219), and 21,000 B.P. \pm 100 years (GIN-186); the last sample came from the contact zone with igneous ash. The artifacts collected in Layer 6 of Ushki I included wedge-shaped (Fig. 21: 1-4) and conical (Fig. 21: 5) cores, bifacially flaked arrowheads and points (Fig. 21: 6-13), scrapers of several varieties (Fig. 22: 6-10), knives with retouched or polished working edges (Fig. 22: 1-5), abraders with grooves, and unifacially and bifacially flaked scrapers (*skreblo*) and knives (Fig. 22: 11). There were also numerous ornaments, including forms typical of late prehistoric and even historical cultures of

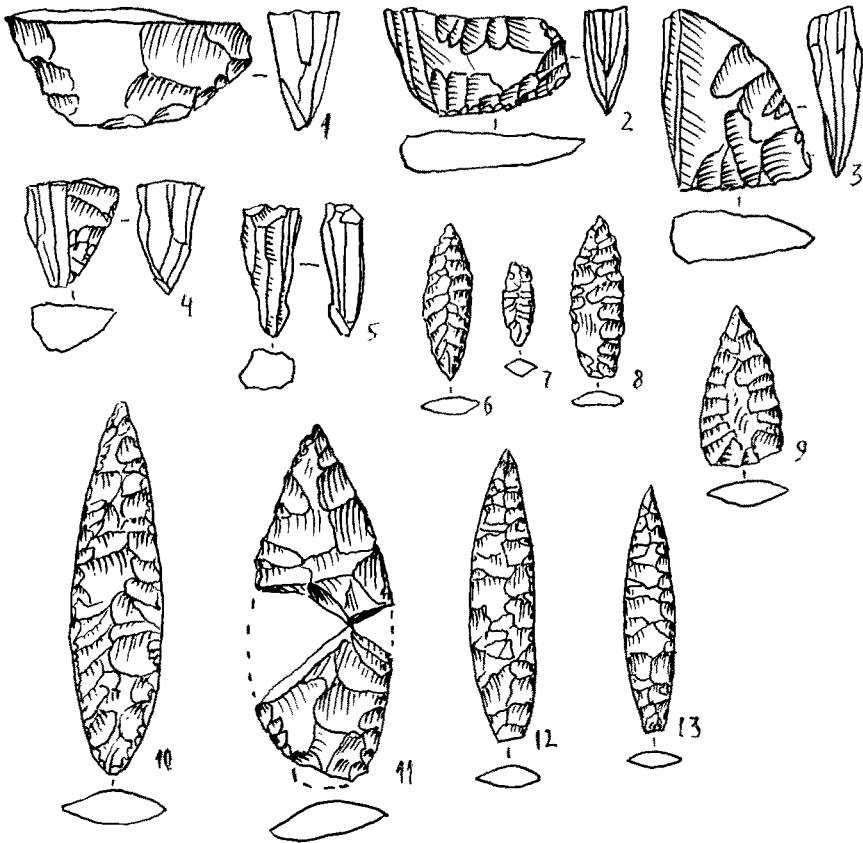


Fig. 21. Artifacts of the late Ushki culture: (1-5) cores; (6-13) points (Dikov, 1979).

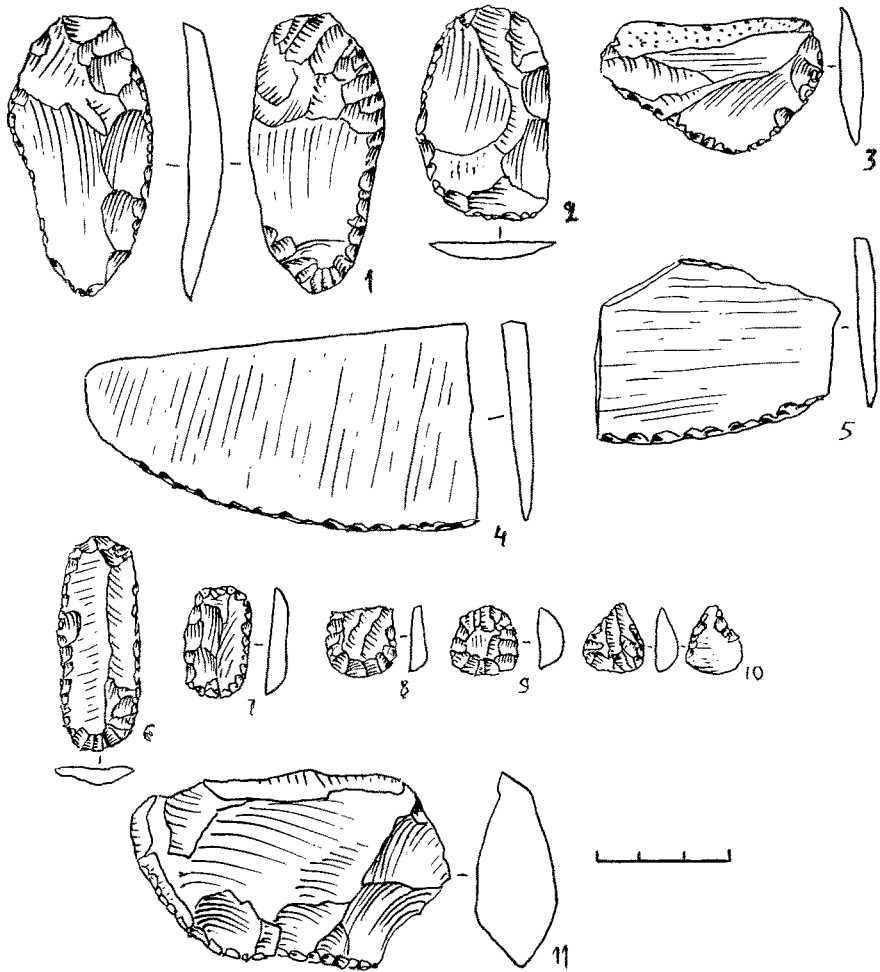


Fig. 22. Artifacts of the late Ushki culture: (1-5) knives; (6-10) scrapers; (11) scraper (*skreblo*) (Dikov, 1979).

the North (*Paleolit SSSR*, 1984, p. 327). One final, interesting group of artifacts was a plate with a cruciform pattern and tiny holes in each branch of the cross (Dikov, 1979a, p. 66) (Fig. 23: 8) and several slabs with engraved lines (Fig. 23: 7, 9). These finds are the only art known, apart from the depiction of mammoth found 50 km from Berelekh (Fig. 18: 7).

Some scholars consider the stone industry of Ushki I to be unique. Abramova, for instance, believes that arrowheads are unusual in the Paleolithic of northern Asia, since Siberian Paleolithic and Mesolithic sites lack stemmed points like those of Layer 7 of Ushki I. Instead, we must look for analogies in

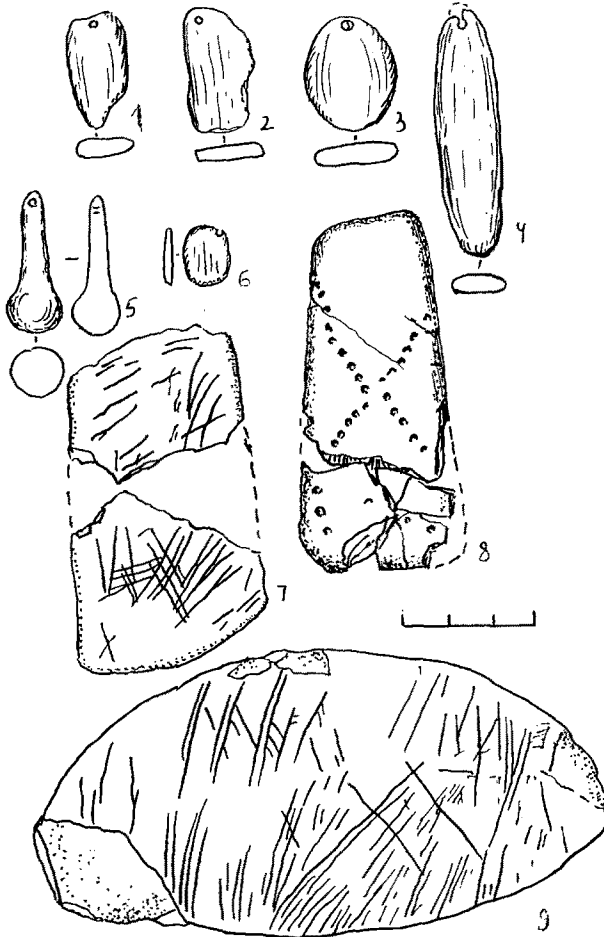


Fig. 23. Ornaments of the late Ushki culture: (1-6) pendants; (7, 9) engraved slabs; (8) slab with cruciform pattern (Dikov, 1979).

Japanese and American sites (*Paleolit SSSR*, 1984, pp. 327-328). Mochanov points out that there are problems with the stratigraphy of Ushki I, and he considers the stemmed points of Layer 7 to be redeposited from the Neolithic of Layer 3 (Mochanov, 1977, p. 224).

After this short review of what is currently known of the Upper Paleolithic of northeastern Siberia and the Russian Far East, the fragmentary data outlined above need further synthesis to assess their overall place among the Paleolithic of the surrounding regions. This can now be done, in part, because of recent statistical analyses of some of the Paleolithic assemblages discussed here.

THE PLACE OF NORTHEASTERN SIBERIA AND THE RUSSIAN FAR EAST IN THE PALEOLITHIC OF NORTHERN ASIA

Today the predominant methodology for distinguishing cultures is still based on identifying the spatial and temporal localization of archaeological material by isolating "the set of specific classes of tools, the techniques of their primary and secondary flaking typical only for this or that culture and . . . by analysis of certain diagnostic traits, determining the cultural affinity of newly discovered sites" (Vasil'ev, 1988, p. 65). However, doubts have been expressed, not only by Vasil'ev but also by others, of the usefulness of the concepts of "local culture" and "local variant" for describing the true diversity of archaeological complexes. Hence, in some works the terms "D'uktai culture" and "D'uktai tradition" have the same meaning, even though Mochanov distinguished three levels of cultural units from the Aldan sites: cultural variants, local cultures, and cultural traditions (Mochanov, 1977, p. 226). In fact, his distinction seems to be unnecessarily complex, since the material from the Aldan sites, "except for the particular leaf-shaped artifacts, are the same as we usually find at sites on the Yenisei and Aldan Rivers in the Trans-Baikal area. This similarity is also true for the primary flaking techniques . . . and the tool-typology" (Vasil'ev, 1988, p. 77). We mention this opaque argument to suggest that, at present, the concepts of culture used in Russian Paleolithic research are inadequate to account satisfactorily for the patterning in the data. Clearly, this is the case not because of the incompleteness of the data base itself, but because of the weakness of our theories. It is apparent that we need to take a different approach to the material from that which has been used previously.

We have studied the collections of the D'uktai culture with the aim of comparing their typological structures with the structures of nearby sites. For this purpose, we have used Felinger's (1985) algorithm of optimal grouping. Our selection of variables was determined by the relevancy and accuracy of the available data. Expediency forced us to reduce the number of tool classes to 29. The crudeness of the typology of the most common varieties (scrapers, *skreblo*, denticulates, notched artifacts, and so on) has affected our final results; nevertheless, we are still able to make some advances beyond earlier ideas.

The sites of the D'uktai culture were statistically divided into two large groups. The first is composed of the assemblages of D'uktai Cave, with very high percentages of bifacial pieces (24–43% in Layers 8 and 7a, respectively), as well as *skreblo* and blades with lateral retouch. These assemblages are the most closely linked, whereas those from Ustinovka (Layer 3c, d) (Vasil'evskiy and Kashin, 1983), Bayan-Nur Somon (Derev'anko *et al.*, 1985), Maina (Layer 2) (Vasil'ev and Yermolova, 1983), and Ust'-Karakol (Layer 3) (Derev'anko *et al.*, 1987) show a lesser degree of similarity. In the final stage, Ezhantsi and Kamnemoost Cave join this group (Amirkhanov, 1986); both sites are character-

ized by a predominance of burins in their tool kits (70 and 30%, respectively) and by the presence of radial and wedge-shaped cores. The first group is completed by a series of sites in the Trans-Baikal area (Tanga, Sukhotino IV, Sanni Mis), the Angara basin [Sosnoviy Bor, Ust'-Kova (the middle complex)], the Rivers Selemdzha and Tuva (Sagli), the Krasnoyarsk region (Kantegir, Dzhoi, and others), and the River Aldan (Verkhnetroitskaya). Altogether, the first group is an amorphous unit composed of sites grouped on several different bases.

The second group of D'uktai sites includes Kurung II, Noviy Leten (Layer 4), Ushki I (Layers 6 and 7), Ust-Mil' II, Tumular, Berelekh, Kukhtuy, and Suvorovo III (Vasil'evskiy and Gladishev, 1989). All of these have higher frequencies of bifaces (28–83%) than does the first group of sites.

The assemblages from Ust'-Ul'ma I (Layers 1, 2a, b, and 3) (Zenin, 1989) also join this group (with 18–24% bifaces), as does a pair of assemblages from Kost'enki 1 (Layer 5) and Szeleta. The first of these is assigned the Kost'enki-Streletsian culture (*Paleolit kost'enkovsko-borshchevskogo rayona na Donu*, 1982, pp. 65–66), which, like the D'uktai culture, is also characterized by the importance of shallow bifacial retouch. The assemblage from Kost'enki 1 (Layer 5) included a disk and a wedge-shaped core. The similarity of the Szeletian to the D'uktai culture was first observed by Müller-Beck (1966), who explained it as a diffusion of the Szeletian from Europe to the Far East. There have also been attempts to derive the Kost'enki culture from the Szeletian, on the basis of the presence of bifacially flaked points in both. However, Mochanov correctly observed that these similarities result not from the spreading of these cultures from Europe to Asia, but from their origins in Middle Paleolithic cultures which had much in common in basic technology and typology (Mochanov, 1977, p. 236).

The concept of local, isolated, Paleolithic cultures is not consistent with the known distribution of bifacial assemblages, with the numerous parallels between them and unifacial assemblages, or with the absence of sharp territorial outlines. At the present stage of research, we may speak only of the existence of interregional cotraditions. This echoes Vasil'ev's (1988, p. 80) thought that "at present, unlike the days of Zam'atnin and Okladnikov, no-one can propose definitions which embrace all the northern Asiatic sites and permit us to differentiate them from the European sites." Today, we may discuss only the predominance of this or that variant of the Upper Paleolithic in certain regions.

FUTURE DIRECTIONS OF RESEARCH

In our series of surveys of the Stone Age of northern Asia (Larichev *et al.*, 1987, 1988, 1990), we have outlined the most important aspects of this field of research. Our hypothetical framework—of the first colonization of the region, and of the dating and interactions of the Paleolithic industries—remains only a

framework, consisting of fragments selected by chance and reflecting only a part of the complete systems which existed in the past.

The blanks in our knowledge will eventually be filled by the expanding scale of scientific research in northern Asia, and the increasing amount of information will help in our understanding of some of the existing problems. However, a simple increase in quantities of archaeological material will not, in the end, suffice. Much will depend on our theoretical approaches, which are still to be worked out. The main obstacle to this is that most archaeologists have no desire to be synthesists. It has recently been shown that the division of Siberian archaeologists' interests between field and theoretical research seems to be heavily biased toward the former (Derev'anko *et al.*, 1989b, p. 38). Only slightly over 1% of archaeological works published in the USSR in 1973–1978 had theoretical and methodological sections (Derev'anko *et al.*, 1989b, p. 39).

Within the last decade, there has been some improvement in the orientation of research. In Novosibirsk, articles and monographs have been published dealing with matters of methodology, which bode well for the future (Derev'anko *et al.*, 1985, 1989a, 1990, 1991). These publications clearly reflect the fact that Siberian scholars understand the need to devise new methodologies and approaches to the study of prehistoric objects.

For example, Larichev and Sazonov have created new methods and instrumentation for the measurement of art objects of the Stone Age. As a result, the first scientifically founded interpretations have been made of Paleolithic art objects in Siberia, and the level of confidence of our interpretation of Paleolithic people's profound and wide perception of Nature and of themselves has become much higher (Larichev and Sazonov, 1989, p. 177).

New and exciting possibilities also arise with the development of systemic, classificatory analysis, an approach based on the hypothesis of the existence of a universal periodic law (Grazhdannikov, 1985). Classificatory analysis may be used to predict fundamental historical tendencies and to expand the scope of archaeological research. At present, it is used in three main spheres: archaeological periodization, the classification of archaeological research itself, and the periodic classification of archaeological ideas (Grazhdannikov and Khol'ushkin, 1990, 1991). It may also be applied to the history of archaeological science.

Siberian archaeology has also benefited from the application of cluster analyses and from the development of methods of analysis of archaeological materials at different levels of typological refinement. This makes it much easier to test hypotheses and to verify interpretations of the results. The recent publication of a monograph on information science (Derev'anko *et al.*, 1989a) illustrates the coming changes in approaches to the handling of archaeological data.

Much has also been accomplished in increasing the accuracy of basic archaeological data, rather than simply increasing the complexity of our overall research.

We believe, in light of these new approaches and perspectives, that it will be possible to solve at least some of archaeology's problems, and we foresee the development of new and exciting scientific trends in the study of the Siberian Paleolithic.

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REFERENCES

- Abramova, Z. A. (1989). Paleolit Severnoy Azii (Paleolithic of North Asia). In *Paleolit Kavkaza i Severnoy Azii. Paleolit Mira. Issledovaniya po arkhologii kamennogo veka*, Nauka, Leningrad, pp. 144–243.
- Alexeev, A. N. (1987). *Kamenniy vek Ol'okmi* (The Stone Age of Ol'ekma), Nauka, Irkutsk.
- Amirkhanov, H. A. (1986). *Verkhniy paleolit Prikuban'ya* (The Upper Paleolithic of the Cis-Kuban' Area), Nauka, Moscow.
- Cherosov, N. M. (1988). Pam'atniki kamennogo veka tsentral'noi chasti Prilenskogo plato (Stone Age sites in the central part of the Cis-Lenan Plateau). In *Arkheologiya Yakutii*, Nauka, Yakutsk, pp. 54–71.
- Derev'anko, A. P. (1983). *Paleolit Dal'nego Vostoka i Korei* (Paleolithic of the Soviet Far East and Korea), Nauka, Novosibirsk.
- Derev'anko, A. P., Dorge, D., Vasil'evskiy, R. S., Larichev, V. Ye., and Petrin, V. T. (1985). *Arkheologicheskiye issledovaniya v Mongolii. Mestonakhozhdeniya v 27 km k severo-zapadu ot Bayan-Nur somona (zimnego)* (Archaeological investigations in Mongolia), Manuscript on file, Institute of History, Philology and Philosophy, Novosibirsk.
- Derev'anko, A. P., Molodin, V. I., and Markin, S. V. (1987). *Arkheologicheskiye issledovaniya na Altaye v 1986 godu (predvarit'el'niye itogi sovetско-yaponskoy ekspeditsii)* (Archaeological investigations in the Altai in 1986), Manuscript on file, Institute of History, Philology and Philosophy, Novosibirsk.
- Derev'anko, A. P., Felinger, A. F., and Khol'ushkin, U. P. (1989a). *Metodi informatiki v arkheologii kamennogo veka* (Information science in the archaeology of the Stone Age), Nauka, Novosibirsk.
- Derev'anko, A. P., Felinger, A. F., and Khol'ushkin, U. P. (1989b). Sotsiologicheskiy analiz kadrov arkheologov Sibiri (Sociological analysis of archaeologists of Siberia). In *Metodicheskiye problemi rekonstruktsiy v arkheologii i paleoekologii*, Nauka, Novosibirsk, pp. 33–43.
- Derev'anko, A. P., Volkov, P. V., and Grebenshchikov, A. V. (1989c). Paleoliticheskiye kompleksi Barkasnoy sopki na reke Selemdze (Paleolithic complexes of the Barkas Hill on the River Selemdza). In *Drevnosti Sibiri i Dal'nego Vostoka*, Nauka, Novosibirsk, pp. 73–82.
- Derev'anko, A. P., Felinger, A. F., and Khol'ushkin, U. P. (1990). Opit statisticheskogo grupirovaniya rannepaleoliticheskikh kompleksov Evrazii. (An experimental statistical grouping of the Early Paleolithic complexes of Eurasia). In *Kompleksnoye issledovaniye paleoliticheskikh obyektov basseina reki Anuy*, Nauka, Novosibirsk, pp. 165–188.
- Derev'anko, A. P., Felinger, A. F., and Khol'ushkin, U. P. (1991). Opit statisticheskogo grupirovaniya pozdnepaleoliticheskikh kompleksov Evrazii (An experimental statistical grouping of the Late Paleolithic complexes of Eurasia). In *Metodi rekonstruktsiy v arkheologii*, Nauka, Novosibirsk, pp. 44–58.
- Dikov, N. N. (1977). *Arkheologicheskiye pam'atniki Kamchatki, Chukotki i Kolimi. Aziya na stike*

- s *Amerikoy v drevnosti* (Archaeological sites of Kamchatka, Chukotka and the Upper Kolima), Nauka, Moscow.
- Dikov, N. N. (1979a). *Drevniye kul'turi Severo-Vostochnoy Azii. Aziya na stike s Amerikoy v drevnosti* (Ancient cultures of northeastern Asia), Nauka, Moscow.
- Dikov, N. N. (1979b). Issledovaniye kamchatskoy verkhnepaleoliticheskoy stoyanki Ushki I (Investigation of the Upper Paleolithic site Ushki I in Kamchatka). In *Arkheologicheskiye otkritiya 1978 goda*, Nauka, Moscow, pp. 220–221.
- Felinger, A. F. (1985). *Statisticheskiye algoritmi v sotsiologicheskikh issledovaniyakh* (Statistical algorithms in sociological investigations), Nauka, Novosibirsk.
- Gladishev, S. A. (1986). Arkheologicheskiye razvedki v doline reki Zerkal'naya, Yuzhnoye Primor'ye (Archaeological surveys in the valley of Zerkal'naya, Southern Maritime Region). In *Problemi arkheologii Severnoy i Vostochnoy Azii*, Nauka, Novosibirsk, pp. 89–99.
- Gladishev, S. A. (1987). Verkhnepaleoliticheskiye nukleusi stoyanki Suvorovo III (Upper Paleolithic cores from Suvorovo III). In *Severnaya Aziya v epokhu kamn'a*, Nauka, Novosibirsk, pp. 71–82.
- Golubev, V. A., and Lavrov, E. L. (1988). *Sakhalin v epokhu kamn'a* (Sakhalin in the Stone Age), Nauka, Novosibirsk.
- Grazhdannikov, E. D. (1985). *Metodi y sistematizatsii filosofskikh kategoriy* (Methods of systematization of philosophical categories), Nauka, Novosibirsk.
- Grazhdannikov, E. D., and Khol'ushkin, U. P. (1990). *Sistemnaya klassifikatsiya sotsiologicheskikh i arkheologicheskikh pon'atiy* (System of classification of sociological and archaeological ideas), Nauka, Novosibirsk.
- Grazhdannikov, E. D., and Khol'ushkin, U. P. (1991). Sistemno-khronologicheskaya model' antropogeneza (A systemic and chronological model of anthropogenesis). In *Metody rekonstruktsiy v arkheologii*, Nauka, Novosibirsk, pp. 22–32.
- Khol'ushkin, U. P. (1981). *Problemi korrel'atsii pozdnepaleoliticheskikh industriy Sibiri i Sredney Azii* (Problems of correlation of the Late Paleolithic industries of Siberia and Central Asia), Nauka, Novosibirsk.
- Kind, N. V. (1974). Geokhronologiya pozdnego antropogena po izotopnim dannim (Geochronology of the late anthropogene according to the isotopic data). *Trudi GIN AN SSSR* 257.
- Larichev, V. Ye., and Sazonov, V. I. (1989). Achinskaya skul'ptura iz bivn'a mamonta: Instrumentariy i metod geometricheski korrektnogo prostranstvennogo obmera form i grafoanaliticheskoy restavratsii na eyo primere (An ivory sculpture from Achinsk: instruments and method of geometrically correct spatial measuring of forms and graphoanalytical restoration). In *Metodicheskiye problemi rekonstruktsiy v arkheologii i paleoekologii*, Nauka, Novosibirsk, pp. 104–180.
- Larichev, V. Ye., Khol'ushkin, U. P., and Laricheva, I. P. (1987). Lower and Middle Paleolithic of Northern Asia: Achievements, problems and perspectives. *Journal of World Prehistory* 1: 415–464.
- Larichev, V. Ye., Khol'ushkin, U. P., and Laricheva, I. P. (1988). The Upper Paleolithic of Northern Asia: Achievements, problems, and perspectives. I. Western Siberia. *Journal of World Prehistory* 2: 359–396.
- Larichev, V. Ye., Khol'ushkin, U. P., and Laricheva, I. P. (1990). The Upper Paleolithic of Northern Asia: Achievements, problems, and perspectives. II. Central and Eastern Siberia. *Journal of World Prehistory* 4: 347–385.
- Mazin, A. I. (1987). Raskopki mnogosloynoy stoyanki "Zmeinaya" (Excavations of the multi-layered "Zmeinaya" site). In *Issledovaniya pam'atnikov drevnikh kul'tur Sibiri i Dal'nego Vostoka*, Nauka, Novosibirsk, pp. 164–165.
- Mochanov, U. A. (1977). *Drevneyshiy etapi zaseleniya chelovekom Severo-Vostochnoy Azii* (The earliest stages of the peopling of northeastern Asia), Nauka, Novosibirsk.
- Mochanov, U. A., Fedoseeva, S. A., Alexeev, A. N., et al. (1983). *Arkheologicheskiye pam'atniki Yakutii. Basseini Aldana i Ol'okmi* (Archaeological sites of Yakut. The Aldan and Ol'ekma Basins), Nauka, Novosibirsk.
- Morlan, R. E. (1966). The preceramic period of Hokkaid: An outline. Manuscript on file, Institute of History, Philology and Philosophy, Novosibirsk.
- Müller-Beck, H. (1966). Paleohunters in America: Origins and diffusion. *Science* 152: 1191–1210.

- Okladnikov, A. P. (1947). *Ocherki po istorii Yakutii—ot paleolita do prisoedineniya k Russkomu gosudarstvu* (Essays on the history of Yakut—from the Paleolithic to joining the Russian state), Ph.D. dissertation, Leningrad.
- Okladnikov, A. P. (1955). *Yakutiya do prisoedineniya k Russkomu gosudarstvu* (Yakut before it joined the Russian state), Nauka, Moscow-Leningrad.
- Okladnikov, A. P. (1966). Drevneye poseleniye na reke tadushi u derenvi Ustinovki i problema dal'nevostochnogo mezolita. (An ancient settlement on the River Tadushy, near Ustinovka and the problem of the Far Eastern Mesolithic). In *Chetvertichnyy period Sibiri*, Nauka, Moscow, pp. 352–372.
- Okladnikov, A. P. (1981). *Paleolit Tsentral'noy Azii. Moil'tin-Am (Mongolia)* [The Paleolithic of Central Asia: Moil'tin-Am (Mongolia)], Nauka, Novosibirsk.
- Okladnikov, A. P., and Derev'anko, A. P. (1973). *Dal'okoye proshloye Primor'ya i Priamur'ya* (The Soviet Primor'ye and Cis-Amur Area in Antiquity), Nauka, Vladivostok.
- Paleolit kost'onkovsko-borshchevskogo rayona na Donu. 1879–1979. Nekotoriye itogi polevikh issledovaniy, 1982 god.* (Paleolithic of the Kostenki-Borshchevo region on the River Don. 1879–1979. Some results of the field investigations of 1982) (1982). Nauka, Leningrad.
- Paleolit SSSR* (Paleolithic of the USSR) (1984). Nauka, Moscow.
- Tomskay, A. I., and Savinova, G. M. (1975). Sporopil'tseviye spektri otlozheniy dolini r. Aldan, vkl'uchayushchikh paleoliticheskiye pam'atniki (The spore and pollen spectra of deposits of the Aldan river valley, including the Paleolithic sites). In *Yakut and Its Neighbours in Antiquity*, Nauka, Yakutsk, pp. 31–37.
- Tseitlin, S. M. (1979). *Geologiya Severnoy Azii* (Geology of Northern Asia), Nauka, Moscow.
- Vasil'ev, S. A. (1988). Lokal'niye kul'turi i spetsifika verkhnego paleolita Sibiri (Local cultures and specificity of the Upper Paleolithic of Siberia). In *Metodicheskiye problemi arkheologii Sibiri*, Nauka, Novosibirsk, pp. 64–82.
- Vasil'ev, S. A., and Yermolova, N. M. (1983). Mayninskaya stoyanka—noviy pam'atnik paleolita Sibiri (Maina: A new Paleolithic site in Siberia). In *Paleolit Sibiri*, Nauka, Novosibirsk, pp. 76–75.
- Vasil'evskiy, R. S. (1979). Dokeramicheskiye kompleksi Sakhalina i ikh korrel'atsiya s pam'atnikami sopredel'nykh territoriy (Preceramic complexes of Sakhalin and their correlation with those of contiguous territories). In *Drevniye kul'turi Sibiri i Tikhookeanskogo basseyna*, Nauka, Novosibirsk.
- Vasil'evskiy, R. S. (1983). Levalluzskiy traditsii v kamennikh industriyakh Severnoy Azii i Severnoy Ameriki (The Levallois tradition in the lithic industries of Northern Asia and North America). In *Pozdnepleistotsenoviye i rannegolotsenoviye kul'turniye sv'azi Azii i Ameriki*, Nauka, Novosibirsk, pp. 27–36.
- Vasil'evskiy, R. S. (1985). Stoyanka Suvorovo III i eyo mesto v kamennom veke Dal'nego Vostoka (The site of Suvorovo III and its place in the Stone Age of the Soviet Far East). In *Kamenniy vek Severnoy, Sredney i Vostochnoy Azii*, Nauka, Novosibirsk, pp. 86–95.
- Vasil'evskiy, R. S., and Gladishev, S. A. (1989). *Verkhniy paleolit Yuzhnogo Primor'ya* (The Upper Paleolithic of the southern Maritime Region), Nauka, Novosibirsk.
- Vasil'evskiy, R. S., and Kashin, V. A. (1983). Raskopki mnogosloynnogo poseleniya Ustinovka I v 1980 godu (Excavation of the multi-layered Ustinovka I site in 1980). In *Paleolit Sibiri*, Nauka, Novosibirsk, pp. 44–66.
- Vereshchagin, N. K. (1979). Ostatki mlekopitayushchikh iz paleoliticheskogo sloya VI stoyanki Ushki I (Remains of mammals from the Paleolithic layer VI of Ushki I). In *Noviye arkheologicheskiye pam'atniki severa Dal'nego Vostoka*, Magadan, pp. 18–19.
- Zenin, V. N. (1987). Paleoliticheskaya stoyanka na reke Selemdga (A Paleolithic site on the River Selemdzha). In *Issledovaniye pam'atnikov drevnikh kul'tur Sibiri i Dal'nego Vostoka*, Nauka, Novosibirsk, pp. 170–171.
- Zenin, V. N. (1988). K voprosu o datirovke paleoliticheskogo mestonakhzhdeniya Ust'-Ul'ma v Priamur'ye (On the problem of dating the Paleolithic Ust'-Ul'ma locality in the Cis-Amur area). In *Istoriografiya i istochniki izucheniya istoricheskogo opita osvoeniya Sibiri, Vol. 1*, Nauka, Novosibirsk, pp. 13–14.
- Zenin, V. N. (1989). *Mnogosloynniye stoyanki v ust'ye reki Ul'mi i periodizatsiya pozdnego paleolita Verkhnego Priamur'ya* (Multi-layered sites in the mouth of the Ul'ma and the periodization of the Late Paleolithic of the Upper Amur Basin), Nauka, Novosibirsk.