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The Middle and Upper Palaeolithic of the Altai

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Abstract: In this article, the most recent data on the Mousterian and the Upper Palaeolithic of the western part of the Altai-Sayan mountain area are presented. Stylistic peculiarities technological of industrial complexes of sites and site groups are reviewed. The issues of relative and absolute chronology of the technocomplexes and their evolution are discussed. The Altai Middle Palaeolithic industries are compared with those of Eurasia including Northwestern and Central Europe, the North Caucasus, the Crimea and the Near East. The question concerning an independent origin of the Mousterian in Southern and Northern Asia is considered. The genesis model of the Altai Upper Palaeolithic and its initial stage from a variant of the typical Mousterian is outlined.

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INTRODUCTION

Modern notions about the Mousterian and the Upper Palaeolithic cultures of the Altai, as a part of the Altai-Sayan mountain country are founded on the status of the empirical basis that has been significantly altered during the last decade. These changes concern both the quantity of sources, particularly the ones preceding the Upper Palaeolithic stage, and their quality with regard to, first of all, the chronological evaluation of their existence.

The present status of the study of archaeological sites and their artefact collections allows us to chronologically classify the archaeological material, to give its generalized characteristics and to compare it with the Eurasian industries of the same stage.

In Siberia, the Mousterian sites are geographically unevenly distributed. Moreover, some cannot be adequately evaluated (e.g. in the Transbaikal region). In some areas (the Angara region), the Mousterian culture has not been identified as a separate techno-chronological stage. The Levallois-Mousterian materials of the Tuva and the Upper Yenisey regions are represented by surface finds only (ASTAKHOV 1986, sine 1992 etc.). In the Upper Yenisey region, artefacts are deposited in the present washed-out (beach) sediments on the banks of the Krasnoyarsk water reservoir. In the foothills of the Kuznetsky Alatau, scanty industries from the Dvuglazka Grotto (strata 5–7) are attributed to the Mousterian as well (ABRAMOVA 1985).

THE ALTAI MOUSTERIAN

The Mousterian localities are especially abundant in the Altai area. Chronologically, some of them can be consecutively distributed within the classical Mousterian stage, assigned to the early and middle parts of the last glacial.

The first line in this interval should can be probably attributed to the industries from strata 9–10 of the terrace zone of the Denisova Cave. The geological section of the cave has been studied by magnetostratigraphy, and changes of magnetic polarity signal have been recorded. It has been noted that the majority of sediments at this site have normal polarity characteristics of the Brunhes Polarity Epoch. Stratum 11 and the floor of stratum 9 produced a magnetic remanence deviation interval comparable with the Blake Event (110 ka), which corresponds to the 5 stage of the isotope-oxygen scale. According to palynological data, this portion of sediments was formed under conditions of alternation of four kryomers and four thermomers with cenoses of Middle Asian semideserts which can be considered as the best modern analogue of vegetation. On the strength of available data, the Mousterian industry of stratum 10 and the floor of stratum 9 can be dated to the time interval between 80 000 and 115 000 yr. BP. This, however, is not completely in line with a TL date obtained from the top of stratum 10, i.e. 60 000 ± 1600 yr. BP (DEREVIANKO et al. 1992). At another Altai site, Kara-Bom, two Mousterian horizons containing different forms of cores, three Levallois flakes, side-scrapers and “beaked” tools, denticulates and notched tools, end-scrapers on blades and flakes has been ESR dated to 63 200 yr. BP.

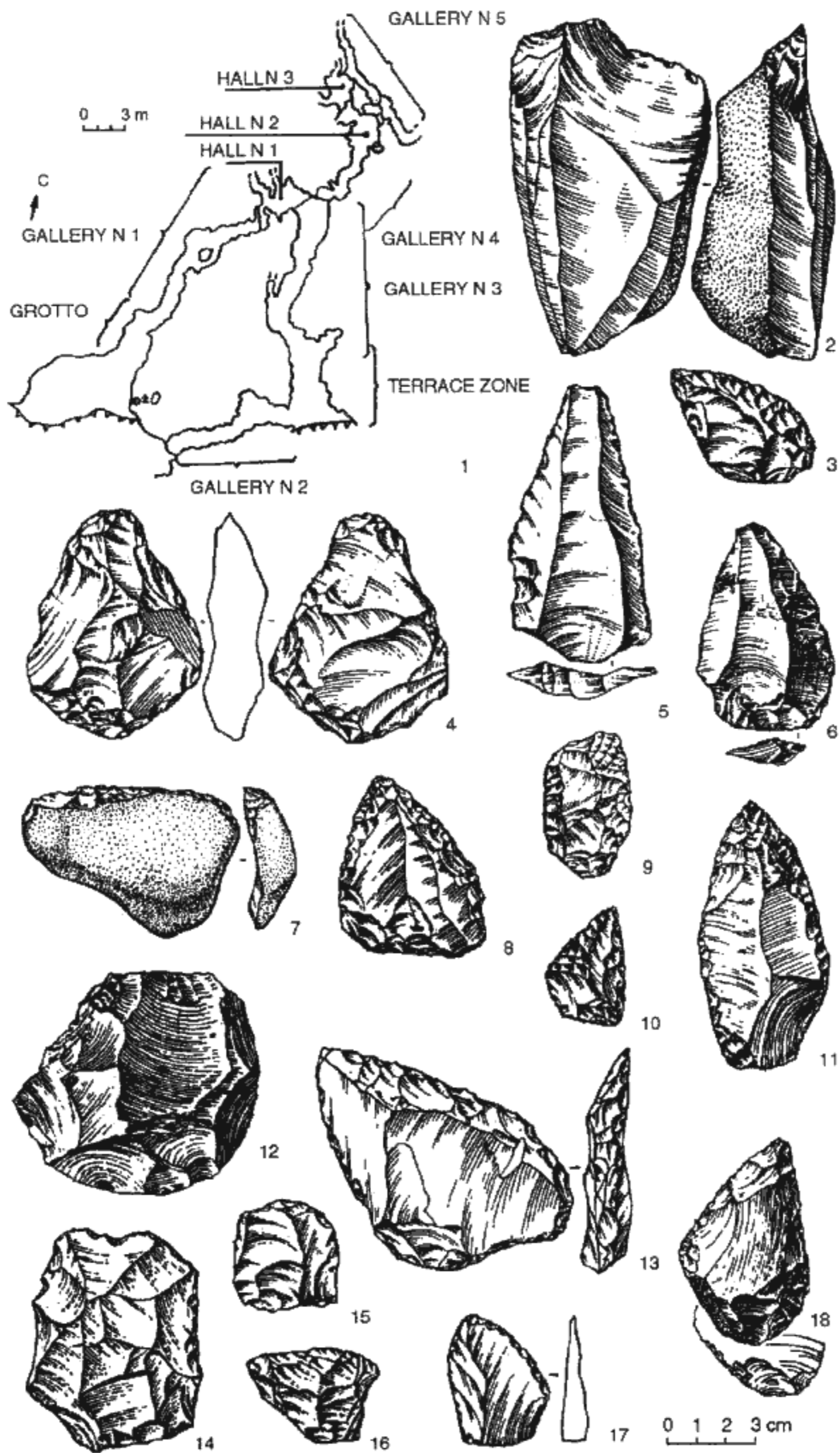


Fig. 1. Materials of the Typical Mousterian from Okladnikov Cave: 1. Plan of the cave. Artefacts from strata 7 (2-5), 3 (6-9), 2 (10-13, 17, 18), 1 (14-16); 2. 12 - cores; 5, 6, 14 - Levallois flakes; 3, 8, 9, 10, 16, 17 and 18 - angular side-scrapers, 7 - simple side-scraper; 11 - Mousterian point; 15 - end-scraper. According to DEREVIANKO and MARKIN (1992).

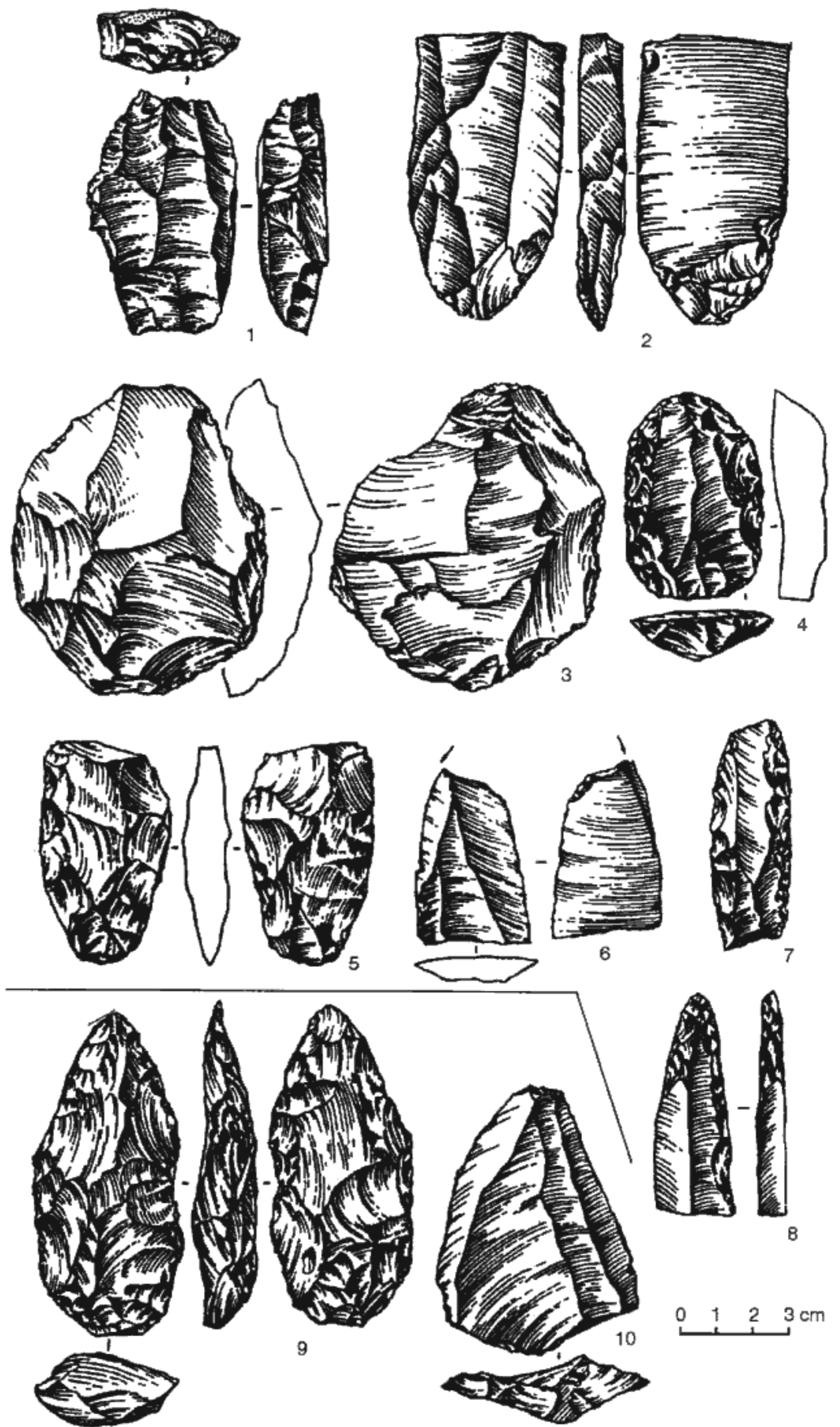


Fig. 2. The Upper Palaeolithic (1-8 stratum 3) and Mousterian? (9-10 stratum 4) artefacts from the Usf-Karakol site: 1, 3 - cores; 2 - trimmed blade; 4 - end-scraper; 5, 9 - bifaces; 6 - burin; 7 - side-scraper; 8 - point; 10 - triangular Lavallois flake. According to DEREVIANKO and PETRIN (1990).

This date was obtained from a sample taken from sterile sediments separating the culture-bearing horizons (PETRIN - CHEVALKOV 1993). Chronological parameters of Strashnaya Cave have not yet been fixed. There is a series of radiocarbon dates obtained from bone samples, all indicating an age of more than 25 000 to 45 000 yr. BP. Palynospectra point to a forest-steppe landscape, followed by xerophilous steppe, which may be indicative of a Karginsk age (mid-Würmian; cf. OKLADNIKOV et al. 1973). Multiple radiocarbon dates of four Mousterian layers were obtained for the Okladnikov Cave. They form an almost continuous series from 44 800 to 33 500 yr. BP. It seems impossible, at this time, to locate chronologically the middle interval of the Denisova section (strata 20-12), which contains Mousteroid industries (DEREVIANKO - MARKIN 1990a), and also the Us'-Kanskaya Cave section (ANISUTKIN - ASTAKHOV 1970). It is also difficult to date stratum 6 at Us'-Karakol (using the material obtained during the 1980s) underlying a late Karginsk date (DEREVIANKO - MARKIN 1990b). The fact that the artefacts were redeposited at the Tumechin I and II sites, coupled with the absence of an initial material required for bio-stratigraphical substantiation, make it impossible to define the age of the Mousterian materials at these localities. It should be noted that at Tumechin I, the industry is dispersed within the proluvial Sartan (late Last Glacial) sediments, forming the upper chronological boundary of the redeposited remains, while the age of the lower boundary of these industries is still obscure (SHUNKOV 1990).

The majority of artefacts from the Mousterian sites of the Altai, the Okladnikov, Denisova, Strashnaya and Us'-Kanskaya Caves and Tumechin I, may be placed within different facies of the typical Mousterian (see Fig. 1) (BORDES 1961).

Summing up the available materials, it can be noted that Mousterian culture of this kind is characterised by the radial, and the Levallois by parallel, as well as unsystematic methods of flaking. A secondary artefact modification was made by edge retouching, encoches, etc. Different techniques of thinning bases of stone tools, trimming their basal parts and flattening the used margins have been observed. If the industries do not comprise significant quantities of the Levallois forms, then the tool kits are dominated by side-scrapers. Points, denticulated and notched forms, beaked tools, typical Upper Palaeolithic artefacts and retouched flakes of different kinds are less numerous. In the collection from the Okladnikov Cave (Fig. 1), side-scrapers and knives with longitudinal and oblique back-facets including a few bifacial tools with modified dorsal face resembling the knives of central European types (WETZEL - BOSINSKI 1969), as well as asymmetrically angular side-scrapers (*déjeté*) of double and triple kinds, are well represented. According to anthropological finds from the Denisova and Okladnikov Caves, bearers of this Mousterian culture were rep-

resentatives of the Neanderthal line of evolution resembling "classical" Neanderthals of Europe and the Near East of the Shanidar II type, but close to the European forms. In terms of race, a bias towards the European genetic affiliation has been observed (TURNER 1990).

Morphological and typological traits of the techno-complexes from the above mentioned sites are comparable with those of distant industries of Eurasia. A formal comparison points to the fact that they all may be attributed to the typical Mousterian. Many similarities may be found with the Mousterian record of southwest France that illustrates the prevalence of side-scrapers over other tool groups, including backed knives, bifaces etc. (BORDES 1981). The typical Mousterian of Eastern Europe is manifested by a combination of the Mousterian point, diagonal side-scrapers, *déjeté* and limace. However, these tool types are quite absent in the Altai (GRIGORIEV 1987). A certain similarity between the collections from the region under study and the industries of the northern Caucasian typical Mousterian (the Borisovskoye Gorge in the Kuban valley region, Monashevskaya, Gubsky Naves I and other sites) is also observed. The latter presents a combination of radial, the Levallois and prismatic techniques, and different forms of side-scrapers, end-scrapers and denticulates (LUBIN 1977). There is a great similarity between the collections from the Okladnikov and Barakaevskaya Caves (LUBIN 1989) where *déjetés*, varying in outlines, position of blades and the character and the angle of convergence of edges, are numerous. In the collection of the Barakaevskaya Cave, there are specific three-bladed convergent forms (*racloir-triple*) which are also typical of the Altai assemblages. It is possible to find a number of analogies with the Crimea Mousterian lying within the range of Central European industries characterized by a wide distribution of bifacial foliated forms (KOLOSOV 1986). The similarity can be traced in side-scrapers, backed tools, *déjeté*-like forms and backed knives. At the same time, certain formal differences can be observed which primarily concern the morphology, variants and number of bifaces. Asian parallels are rather demonstrative. The materials from the Okladnikov Cave are analogous to the Jabrudian variant of the Near Eastern Mousterian, characterised by double and triple angular side-scrapers, small retouched flakes, denticulates and notched tools (RUST 1950, GRIGORIEV 1968, KOROBKOV 1978). A certain similarity is observed between the Altai Mousterian and some materials from Central Asia and Kazakhstan. Collections from the local palaeolithic sites attributed to the Mousterian variant of Central Asia (which was later renamed as the Mountain Mousterian) are dominated by radial cores. The main tool classes are side-scrapers combined with picks, points, end-scrapers and burins (RANOV 1984). The typical Mousterian was isolated in Kazakhstan (Koshkurgan site) where side-scrapers and *déjetés* predominate. Denticulates, notched and beaked forms, burins and end-scrapers are less numerous (ARTUKHOVA 1992).

At present, the origin of the typical variant of the Altai Mousterian culture can not be defined. The interpretation of similarities amongst the materials distributed over a distance of several thousands of kilometres points to migrations of ancient populations, cultural diffusion processes and to the character of a convergent development of the Mousterian Palaeolithic tradition. Possibilities of a transpiration of the Mousterian from the Central Asia to the Altai and further to Mongolia were envisaged by A. P. OKLADNIKOV and from the Near East to Central Asia by V. A. RANOV. Possible movements of early human communities from Europe to Siberia are indicated by the human remains found in the Altai Caves. But what was the rhythm of this movement? Answers to this question mainly depend on dating and classification of the pre-Mousterian industries of Siberia. At the present, according to the TL data from the Denisova Cave, they are attributed to the Middle Pleistocene. A possibility for an independent origin and a subsequent development during stage of the Middle Palaeolithic that was typical for many regions of Eurasia, is not excluded for Siberia as well (DEREVIANKO et al. 1992). It is quite possible that the entire complex of the Altai Mousterian culture is not solely represented by the above mentioned variant of the typical Mousterian. For example, the collections of Tumechin II are described by the investigators as the Denticulate Mousterian in its faceted, non-laminar and non-Levallois manifestations (SHUNKOV 1990). The main tools of the above redeposited site are denticulates. However, there are pebble tools, some of which were also bifacially worked. They are a little less numerous compared to the side-scrapers, but they also define the quality of the industry. Beaked and chisel-like pieces and retouched flakes are represented by single finds only. Inventories of this kind seem to be comparable with the surface series from Central Tuva and the Ubsa-Nur Lake area, which were defined by ASTAKHOV (1986) as a "Mousterian of the Pebble Tradition", as well as with collections of the Altai regions located in Mongolia beyond the Russian border (Olon-Nur 2, Khoit-Tsenkergol 2). The latter sites contain a large amount of pebble forms. However, at the same time they are attributed to the "denticulate-notched line of evolution" of the Mongolian Mousterian (Paleolit i neolit 1990). It is quite possible that, in the future, these complexes will be more distinct and better defined. As for the Altai, the question of the identification of the Denticulate Mousterian of Tumechin II remains open. At the same time, judging by the stratified materials with a predominance of denticulate-notched and beaked forms over side-scrapers, points, end-scrapers and other tools from southern Hangai (Orkhon 1,7) studied by DEREVIANKO and PETRIN (1990), the probability of finding similar sites in Altai is high.

Scarce Palaeolithic materials from the lowermost stratum of Usť-Karakol I site seem to be unusual. They con-

tain a biface similar to elongated foliate forms (Fig. 2: 9–10). It is premature to draw a conclusion about the cultural orientation of such an industry, due to the small size of the lithic assemblage (6 samples only) and chronological limits defined by two Karginsk dates (i.e. $31\,410 \pm 160$ and $29\,900 \pm 2070$ yr. BP) obtained from the overlying bed. At the same time, it should be noted that tools of this kind are typical of Central and Eastern Europe where the Mousterian industries with bifacial foliate points (Blattspitzen), developing on the base of the local Micoquian, are widespread (MÜLLER - KARPE 1996, VALOCH 1967, WYMER 1982). However, single pieces of this kind are represented in the Typical Mousterian sites (ANISSUTKINE 1990). This comparative excursus may allow us to predict that the industries containing bifacial forms will be discovered in the Altai as well.

THE ALTAI UPPER PALAEOLITHIC

The initial stage of the Upper Palaeolithic in the Altai region is characterised by materials of the Karginsk (mid-last glacial) time in the interval from the Malakhetko climatic optimum (43 00–33 00 yr. BP) to the beginning of Lipovo-Novoselovo interstadial (30 000–22 000 yr. BP) (Figs. 2: 1–8; 3). The early Upper Palaeolithic is represented by localities of Kara-Bom (six occupation levels in the stratified site which were coherently radiocarbon dated (on bones and charcoal) from $43\,300 \pm 1600$ to $30\,990 \pm 460$ yr. BP, Kara-Tenesh (four measurements within the range of $26\,875 \pm 625$ and $42\,165 \pm 4170$ yr. BP), the third stratum of the Maloyalomanskaya Cave containing some scarce artefacts ($33\,350 \pm 1145$ yr. BP), the third stratum of Usť-Karakol I ($31\,410 \pm 1160$; $29\,900 \pm 2070$ yr. BP) and Usť-Karakol II comprising isolated flint artefacts only ($31\,430 \pm 1180$ yr. BP). According to the geological stratigraphy, the following localities are attributed to the second half of the Karginsk stage; stratum 11 of the central chamber and strata 7–8 of the terrace zone of the Denisova Cave, stratum 3B of the Strashnaya Cave and stratum 3 (?) of the Anui I site (PETRIN - CHEVALKOV 1993, DEREVIANKO - MARKIN 1990b, DEREVIANKO - ZENIN 1990, 1995, DEREVIANKO et al. 1993, PETRIN et al. 1995).

CONCLUSIONS

Among the main features of the early Upper Palaeolithic collections of the Altai, a typical laminar tendency in stone tool flaking is evident.

1. Technologically, the artefact assemblages are dominated by removals of wide elongated blades from parallel cores, sometimes with shifting flaking platforms. The most distinctive cores have flaked narrow ends, sometimes very similar to those of burins,

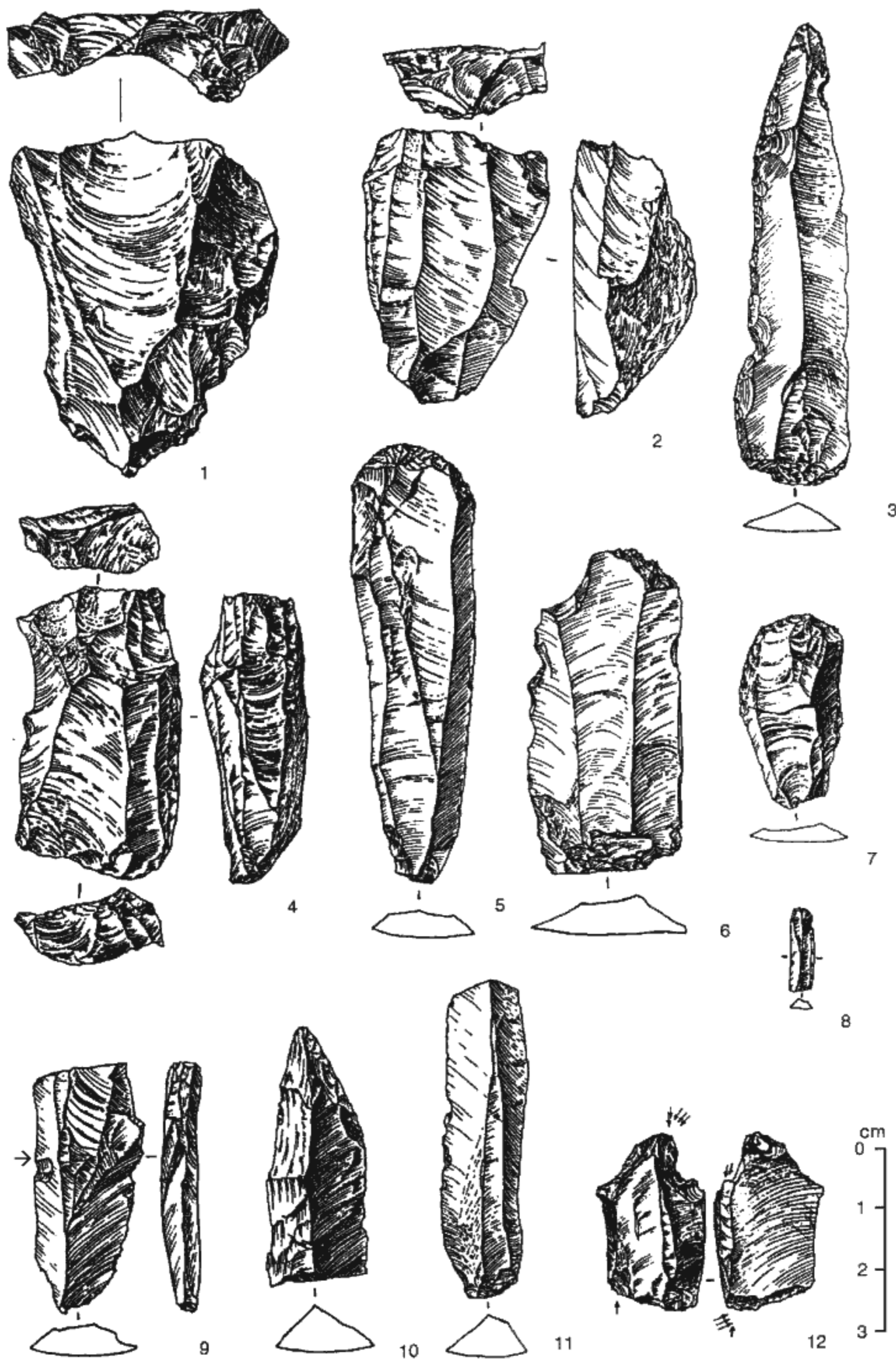


Fig. 3. The most characteristic artefacts from the early Upper Palaeolithic strata of Kara-Bom. 1, 2, 4, 9 – cores; 3, 10 – points; 5, 6, 7 – end-scrapers; 8 – bladelet; 11 – blade; 12 – burin. According to PETRIN and CHEVALKOV (1993).

and are mainly encountered at Kara-Bom. There, as well as at Kara-Tenesh and in stratum 11 of the Denisova Cave, microblades of irregular outlines also appear. At the Usť-Karakol site I, a specific form of cores with bevelled and radial trimming of wide surfaces is present. In addition to parallel cores, the Levallois triangular tortoise-like, radial and multi-platformed irregularly flaked nuclei are also present, though in small quantities.

2. A secondary lithic industry modification is mainly characterised by a direct retouch. An inverse, semi-steep, scaled, scaled-stepped, multi-row and heterofaceted retouching is less common. A thin, lateral and single-row retouch is not typical. At the Usť-Karakol I and Kara-Bom sites, trimming and flattening of the lower surface correcting the curvature of the base is observed (the same technique is represented at the Kara-Tenesh site). Retouched blades, side-scrapers of different kind, denticulated and notched implements and end-scrapers dominate the stone tool assemblages. Blades with a direct regular retouch and retouch organized in two or several rows are well represented. Blades with a ventral retouch are less common (Fig. 2).
3. At Kara-Bom, Kara-Tenesh and Usť-Karakol I sites, flakes with lower surface worked along the proximal end (longitudinal-transversal elongated removals) are encountered. Side-scrapers on flakes and blades are mainly longitudinal, sometimes double, transversal and retouched on the central surface (Fig. 3). Some of them are backed.
4. In the collection from the Strashnaya Cave and the Kara-Bom site, another set of backed tools is represented; they are defined as knives. End-scrapers are mainly made on blades, sometimes with a lateral retouch; end-scrapers on flakes are less numerous (Anui I). At Usť-Karakol, side-scrapers on flakes and bifacial scrapers on elongated blanks are present.
5. Burins are not numerous; they are angular, with one or two edges. Straight dihedral asymmetric burins are less common (Kara-Bom).
6. Chisel-like tools and borers (the Denisova and Strashnaya Caves, Anui I) are rare and often amorphous.
7. Points (Usť-Karakol, Kara-Bom) on blades and flakes are formed by a direct and inverse retouch. The technique of ventral thinning of tools' ends is observed.
8. Denticulated and notched tools, as well as points on the Levallois flakes and wide narrow blades with retouched edges are present at all sites.
9. Pebble tools are represented by single finds (Usť-Karakol, Anui).
10. Flint assemblages of Usť-Karakol I are characterised by the presence of oval and foliated bifaces that are mainly flat-convex with sinuous edges. An asymmetric biface is known from Kara-Bom, but it came

from a nonstratified part of the site. Two fragmented lithics from Anui I should probably also be classified as bifacial.

11. Bone artefacts are not numerous. Only a bone needle and pendants were found in stratum 11 of the Denisova Cave.

DISCUSSION

The Middle-Upper Palaeolithic transition in the Altai

In general, the early Upper Palaeolithic sites located in the Altai foothills form an indistinct entity with some technical and typological variants. According to available material, the process of formation of the new cultural stage in the region was characterised by a gradual transformation of the Mousterian tradition by introduction of the more progressive Late Palaeolithic elements. Presence of the Mousterian and Levallois forms points to the local origin of the Upper Palaeolithic industries from the variants of the Altai Mousterian. Moreover, collections of Kara-Bom, Kara-Tenesh and stratum 11 of the Denisova Cave demonstrate a cultural connection with materials of the Typical Mousterian, while Usť-Karakol II (stratum 3), Anui I (?), containing bifacial forms, possibly continue the evolutionary line of the lithic industry represented in the lowermost layer of Usť-Karakol I. If the combination of various technotypological methods represented in the inventory defines the Mousterian-Upper Palaeolithic transition as a gradual one, then this process might be rather prolonged in time. This phenomenon implies the coexistence of both industries during some period of time. According to the absolute dates, the industry of the first stratum of the Okladnikov Cave (33 300 ± 520 yr. BP) containing the Typical Mousterian set of inventory and practically synchronous assemblage of the early Upper Palaeolithic, may serve as an example.

Blade assemblages of the Altai Upper Palaeolithic culture are quite comparable with industries of the second half of the Karginisk non-glacial time which were widely spread in Siberia, including the Transbaikal region (Malaya Siyja, Makarovo IV, Arembovskogo, Varvarina Gora, some layers of the Bryansk Complex etc.). They represent a combination of the Upper Palaeolithic and Mousterian elements. An analogous facies in the evolution of the blade technology has been recorded in synchronous industries in Mongolia (upper strata of Orkhon 1 and 7, strata 7, 5, 4 of Moiltyn-am), Central and North China (phase II), which testifies that the Upper Palaeolithic formation was similar to that in Siberia (OKLADNIKOV 1981, TANG CHUNG - GAI PEI 1986, DEREVIANKO - PETRIN 1990).

In West Siberia (Shestakovo and possibly the Tomsk

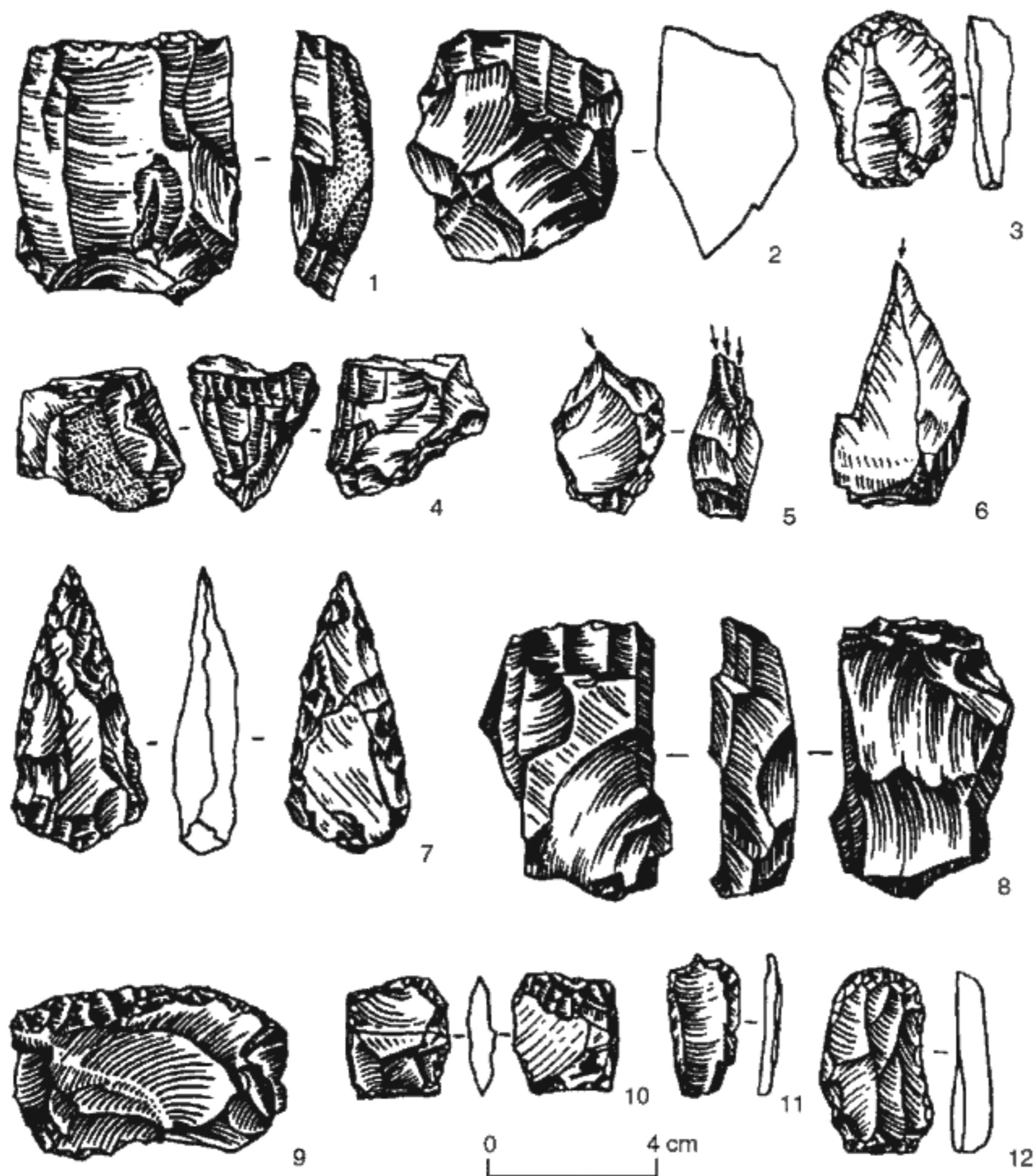


Fig. 4. Lithic implements from the Final Palaeolithics of the Altai region (1–7 Karaturuk, 8–12 Maima): 1, 2, 4, 8 – cores; 3, 12 – end-scrapers; 5, 6 – burins; 7 – foliated biface; 9 – side-scraper; 10 – chisel-like tool; 11 – borer. According to KUNGUROV (1993).

site), the Yenisey River basin (Tarachika, Afanassieva Gora, stratum 3 of Novoselovo 12, stratum 2 of Ui I), the Angara River basin (three layers of redeposited artefacts of Yegiteisky Log I, the lowermost complex of Krasny Yar, Malta, etc.) during the final interval of the Karginsk and the beginning of the Sartan (Last Glacial) stages, there are industries characterized mainly by a prismatic technique of flaking and the presence of blades and elongated flakes that can be well described in terms of the European Upper Palaeolithic. Sites of this kind have not yet been discovered in the Altai region. Collections from the upper part of the section from the Strashnaya Cave, a multilayered site of Anui II (12 archaeological horizons in strata 8–13, radiocarbon dated between 21 000 and 27 000 years BP) do not demonstrate any intermittence in the evolution of the industry at that time (DEREVIANKO - SHUNKOV 1992, DEREVIANKO - ZENIN 1995). There, the

similar sets of artefacts with a variable Upper Palaeolithic typology and flaking techniques and a decreasing number of blade blanks are observed. Formal differences are manifested mainly in the quality of secondary modification of the Upper Palaeolithic tools.

If one accepts the chronological limits of the industry of the Tumechin 4 site in the Ursul River valley (with the suggested age of the Dodgian stage of the Sartan (Weichselian) glaciation being supported by all the data available including the elements of cryogenesis), then in the Altai, the industries containing foliated bifaces in combination with end-scrapers, burins, side-scrapers, denticulated and notched tools and chisel-like tools existed during this interval (SHUNKOV et al. 1994). By the limited number of elongated blanks, this assemblage cannot be classified as a blade industry.

Materials of the final stage of the Upper Palaeolithic

in the Altai (Srostki, lower strata of Usť-Sema and Maima, Urozhainaya, stratum 4 of Usť-Kuyum, Karaturuk, assemblages from the Chuya River valley) possess several common traits (Fig. 4). They are characterised by the technique of parallel flaking from various platform cores, the technique of microblade flaking from wedge-shaped cores (Maima, Kuturuk), and sometimes by radial and other flaking techniques. As a rule, flakes predominate; large blades are not so numerous. Among the tools, side-scrapers are quite distinctive; mainly single convex, sometimes with a partial bifacial marginal treatment (Srostki and Urozhainaya sites). Different kinds of end-scrapers on flakes and blades (circular, oval, core-like microforms) are also present. Borers on flakes are not numerous (Srostki); sometimes they have a massive short spur (Maima) or a thinned point (Usť-Kuyum). Chisel-like forms, points, pebble tools (Yustyd I), bifaces (a triangular point with a convex base from the Karaturuk site oval and subquadrangular samples from the Bidgon, Kuvakhtenar and Yusted sites) are represented by single finds only. There are many denticulated and notched tools at open-air sites in the Chuya valley. Such features as hearths with stones laying around, were recorded in the lower stratum of the Maima site and at Usť-Kuyum.

Generally, industries of this kind continued to develop the earlier elements and genetically clearly originate from the Karginsk and early Sartan (Anui II) materials. Some similarities are observed between the Altai collections on one side and the materials from the Yenisey region, first of all sites of the Afontovo Group (Kokorevo II), sites of the Angara River basin (Fediaev), the Trans-Baikal region (Oshuskovo), and surface finds of the Sagaiskaya Graben and North Mongolia (ABRAMOVA 1989, DEREVIANKO - MARKIN 1987, sine 1990, KUNGURON 1993).

Materials of the northwest Altai (stratum 9 of the central chamber and stratum 1 of the terrace zone of the Denisova Cave, stratum 56 overlying the bedrock at the Iskra Cave) seem to be rather exceptional. Blades and bladelets of irregular outlines removed from flat and prismatic cores constitute the main element of these technocomplexes. Wedge-shaped cores (the terrace zone of the Denisova Cave) and straightly curved naturally pointed blades (Iskra Cave) are also represented. A significant amount of tools was made on elongated blanks. These are retouched blades, end-scrapers, borers, burins, chisel-like forms, etc. The micro-inventory, represented by backed knives, is especially impressive. There is a sample of a miniature segment (stratum 9 of the Denisova Cave). Side-scrapers and points are rare. A set of bone artefacts, comprising composite tools (points), is also present in the collections from both Denisova sections. Judging by the absolute dates (9890 ± 40 yr. BP; $10\ 690 \pm 65$ yr. BP; $10\ 800 \pm 40$ yr. BP), obtained from charcoal samples from stratum 1 of the ter-

race zone of the Denisova Cave), the age of the industrial sets is close to the Pleistocene/Holocene boundary. At present, it is hardly possible to find genetic roots of these materials in local industries. However, some associations with the Yenisey assemblages of the middle stage of the Upper Palaeolithic are apparent (DEREVIANKO - MARKIN 1990, DEREVIANKO et al. 1993, 1995).

It is possible that this quality of the palaeolithic inventory reflects a new approaching epoch in the Altai region during this time period. This picture, however, cannot be generalised for the entire territory. The archaeological data from the Kaminnaya Cave comprise a somewhat different industry. Under the conditions of extensive development of the microprismatic technique, resulting in hundreds of microblades, backed blades are completely absent. They are also not represented in the Holocene deposits. The same situation is at Denisova Cave. At the same time, the analogous phenomenon in the evolution of the final Pleistocene industries has been documented in the region of Upper Yenisey at one of the multilayered sites of the Mainskaya group (VASILEV 1996, VASILEV et al. this volume). This testifies to the similar tendencies in the Upper Palaeolithic evolution during the final stage of its existence over a broader area of Southern Siberia.

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References

- ABRAMOVA, Z. A. (1985): The Mousterian Grotto in Khakassia. - *Kratkiye soobsheniya Instituta arkheologii*, N 181, 97. Moscow. (in Russian).
- (1989): Palaeolithic of Northern Asia. In: *Palaeolithic of the Caucasus and Northern Asia*. - Nauka, 145-265. Leningrad. (in Russian)
- ANISSUTKINE, N. K. (1990): Le moustérien du sud-ouest de L'URSS. - *L'Anthropologie*, 94, 4, 713-738. Paris.
- ANISUTKIN, N. K. - ASTAKHOV, S. N. (1970): On the Issue of the Earliest Sites in the Altai. - *Drevnyaya Sibir*, 3, 27-33. Novosibirsk. (in Russian)
- ARTUKHOVA, O. A. (1992): Mousterian of Central and Southern Kazakhstan. - *Synopsis of the PhD thesis*, 23-24. Alma-Ata. (in Russian)
- ASTAKHOV, S. N. (1986): Palaeolithic of Tuva. - Nauka SB RAS. Novosibirsk. (in Russian)
- BORDES, F. (1961): Mousterian Cultures in France. - *Science*, 134, N 3482. Paris.
- (1981): Vingt-cinq ans après: le complexe moustérien revisité. - *Bull. de la Société Préhistorique Française*, 78, 3, 77-78. Paris.
- DEREVIANKO, A. P. - LAUKHIN, S. A. et al. (1992): First Middle Pleistocene Dates of the Gorny Altai Palaeolithic. - *Doklady Akademii Nauk*, 325, 3, 497-501. Moscow. (in Russian)
- DEREVIANKO, A. P. - MARKIN, S. V. (1987): The palaeolithic of the Chuiskaya Depression. - Nauka. Novosibirsk. (in Russian)
- (1990a): Preliminary Results of Studies of the Altai Mousterian. In: *Archaeological, Ethnographic and Anthropological Investigations in Mongolia*. - Nauka, 73-102. Novosibirsk. (in Russian)

- (1990b): Palaeolithic sites of the Anui River Basin (Review). In: Complex Investigations of the Palaeolithic Sites in the Anui River Basin. – Institute of Archaeology and Ethnography SBN RAS Press, 5–30. Novosibirsk. (in Russian)
- (1992): The Mousterian of Gorny Altai (according to the Materials of the Okladnikov cave). – Nauka. Novosibirsk. (in Russian)
- DEREVIANKO, A. P. - MARKIN, S. V. - BARYSHNIKOV, G. Y. - FEDENEVA, I. K. (1995): Iskra cave - a New Multilayered Site in the Piedmont Altai. – A Review of the Results of Field and Laboratory Studies by Archaeologists, Ethnographers and Anthropologists in Siberia and the Far East in 1993. Institute of Archaeology and Ethnography SB RAS Press, 63–70. Novosibirsk. (in Russian)
- DEREVIANKO, A. P. - PETRIN, V. T. (1990): Stratigraphy of the palaeolithic of southern Khangai. In: Chronostratigraphy of Palaeolithic of Northern, Central and Eastern Asia and America, Institute of Archaeology and Ethnography SB RAS Press, 161–173. Novosibirsk.
- DEREVIANKO, A. P. - SHUNKOV, M. V. (1992): Archaeological investigations in the Anui River Basin. – *Altaica*, 1, 5–10. (in Russian)
- DEREVIANKO, A. P. - SHUNKOV, M. V. - RYBALKO, A. G. (1993): Investigation of Pleistocene deposits of the terrace zone of the Denisova Cave. In: Problems of Preservation and Study of Cultural Heritage of the Altai. Part 1. – Altai State University Press, 30–32. Barnaul. (in Russian)
- DEREVIANKO, A. P. - ZENIN, A. N. (1990): The Palaeolithic locality Anui I. In: Complex Investigation of Palaeolithic Sites in the Anui River Basin. – The Institute of Archaeology and Ethnography SB RAS Press, 31–42. Novosibirsk. (in Russian)
- (1995): The Upper Palaeolithic assemblages in the Strashnaya cave. In: Problems of Preservation and Study of the Altai Cultural Heritage. – Altai State University Press, 24–26. Barnaul. (in Russian)
- GRIGORIEV, G. P. (1968): The Beginning of Upper Paleolithic and the Origin of Homo Sapiens. – Nauka. Leningrad. (in Russian)
- (1987): The Typical Mousterian in Eastern Europe. In: *Zadachi Sovetskoy arkheologii v svete reshenij XXVII siezda KPSS*. – Nauka, 86–87. Moscow. (in Russian)
- KOLOSOV, YU. G. (1986): The Akkayskaya Mousterian Culture. – Naukova Dumka. Kiev. (in Russian)
- KOROBKOV, I. I. (1978): The Palaeolithic of the Eastern Mediterranean. In: Palaeolithic of the Near and the Middle East. – Nauka, 5–185. Leningrad. (in Russian)
- KUNGUROV, A. L. (1993): The Palaeolithic and Mesolithic of the Altai. – Altai State University Press. Barnaul. (in Russian)
- LUBIN, V. P. (1989): The Palaeolithic of the Caucasus. In: Palaeolithic of Caucasus and Northern Asia. – Nauka, 9–142. Leningrad. (in Russian)
- MÜLLER-KARPE, H. (1966): *Handbuch der Vorgeschichte, I, Altsteinzeit*. – München.
- OKLADNIKOV, A. P. (1981): The Palaeolithic of Central Asia. Moltyn-Am (Mongolia). – Nauka. Novosibirsk. (in Russian)
- OKLADNIKOV, A. P. - MURATOV, V. M. - OVODOV, N. D. - FRIDENBERG, E. O. (1973): The Strashnaya cave – a new palaeolithic site of the Altai. In: Materials on Archaeology of Siberia and the Far East. Part 2, Institute of Archaeology and Ethnography SB RAS Press, 3–54. Novosibirsk.
- PETRIN, V. T. - CHEVALKOV, L. M. (1993): Investigations at the Early Man Site of Kara-Bom. In: Problems of Preservation and Study of the Altai Cultural Heritage. Part I. – Altai State University Press, 66–69. Barnaul. (in Russian)
- PETRIN, V. T. - NIKOLAEV, S. V. - NILOV, D. V. - CHEVALKOV, L. M. (1955): Palaeolithic complex of the open air type – Karatenesh (new data). In: Problems of Preservation and Study of the Altai Cultural Heritage. – Altai State University Press, 26–29. Barnaul. (in Russian)
- RANOV, V. A. (1984): Zentralasien in neue Forschungen zur Altsteinzeit. – *Forschungen zur Allgemeinen und Vergleichenden Archäologie*, 4, 299–343. München.
- RUST, A. (1950): *Die Höhlenfunde von Jabrud (Syrien)*. – Offa-Bücher, N. F., 8. Neumünster.
- SHUNKOV, M. V. (1990): The Mousterian Sites of the Intermontane Depressions of the Central Altai. – Nauka. Novosibirsk. (in Russian)
- SHUNKOV, M. V. - NIKOLAEV, S. V. - KRIVOSHAPKIN, A. I. (1994): The Late Palaeolithic Site Tumechin-4 in Gorny Altai. In: Problems of Preservation and Study of the Altai Cultural and Historical Heritage. – Institute of History, Linguistics and Literature Press, 12–13. Gorno-Altai.
- TANG CHUNG - GAI PEI (1986): Upper Palaeolithic Cultural Traditions in North China. – *Advances in World Archaeology*, 5, 339–364.
- TURNER, CH. G. (1990): Palaeolithic teeth of the Central Siberian Altai Mountains. In: Chronostratigraphy of the Palaeolithic in North, Central, East Asia and America. – Institute of Archaeology and Ethnography Press, 239–243. Novosibirsk. (in Russian)
- VALOCH, K. (1967): Le Paléolithique Moyen en Tchécoslovaquie. – *L'Anthropologie*, 71, 1–2. Paris.
- VASIL'EV, S. A. (1996): The Late Palaeolithic of the Upper Yenisey (according to the Materials of the Multilayered Sites of the Maina Region). – Synopsis of PhD thesis. Institute of History of Material Culture Press. St. Petersburg. (in Russian)
- WETZEL, R. - BOSINSKI, G. (1969): *Die Bocksteinschmiede in Lonetal*. – T. 1/2, Veröff. d. Staatl. Amtes für Denkmalpflege, Reihe 1, 15. Stuttgart.
- WYMER, J. (1982): *The Palaeolithic Age*. Groom Helm. London.
- sine (1990): Palaeolithic and Neolithic of the Mongolian Altai. – Nauka. Novosibirsk. (in Russian)
- sine (1992): Archaeology, Geology and Palaeogeography of Palaeolithic Sites in the South of Central Siberia. – Institute of Archaeology and Ethnography SB RAS Press. Krasnoyarsk. (in Russian)