ALBERT RECKITT ARCHAEOLOGICAL LECTURE

EARLY MAN IN THE SOVIET UNION

THE IMPLICATIONS OF SOME RECENT DISCOVERIES

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IT is a great honour to be asked to lecture in the distinguished series founded by the late Albert Reckitt. I recall that on one occasion an earlier speaker further dedicated his lecture to a distinguished exponent in his chosen field. The precedent is one of which I feel Mr. Reckitt, with his singular generosity to our subject, would surely have approved, and so I venture to dedicate my contribution to the memory of our late Fellow Dorothy Garrod, by all consent the leading exponent of Palaeolithic archaeology that this country has produced, and to me personally a close friend and teacher over many years.

Looking over the list of previous titles I see that most have been concerned with the study of the more sophisticated cultures of the last few thousand years; with these it seems to me the archaeology of the earlier stages of man contrasts in a number of fundamental ways, both in aim and approach. Although the former may tell us much of the rise and fall of civilizations and as such of a human condition essentially comparable to our own, this of itself throws little light on the basic formative processes of mankind. It is by contrast with these last that the student of early prehistory is primarily concerned.

Historically speaking the early pioneers of archaeological scholarship, the ancient historians and antiquarians of, say, the eighteenth and early nineteenth centuries, would be almost as much at home as ourselves in our studies of early civilizations, although the existence of many was unsuspected in their day. Historical precedent, linguistics, art history, and the study of architectural monuments were in essence as much a part of their equipment in this field, as they are of ours today. But when we come to inquiries concerned with the emergence of man as such, the actual developmental stages through which he and his behavioural traditions passed, their depth in time and their arrangement in space throughout the world, we enter a field of

scholarship of far more recent growth. Even today we are still groping with much that is fundamental to the issues involved, and that after nearly a century of scientific research; scientific that is to say in that it is based on systematic collection, analysis, and verification of observed data. At the same time it is, of course, true that many conclusions of basic significance have been firmly established, and the tempo of research is continually and rapidly increasing. The accumulation of new discoveries is indeed so great that it requires some daring, or shall I say more frankly, hardihood, to attempt even a partial synthesis of results in any large area, let alone one the size of the Soviet Union.

If I venture on such a task at all and achieve any useful purpose the credit, if credit is due, must go to a large extent to my hosts in the Soviet during my tenure of an all too short Visiting Fellowship to the Academy of Sciences. It is their generosity which enabled me to make a brief first-hand acquaintance with a fraction of the great riches of their national collections in Leningrad, Moscow, and Kiev. At least equally valuable to me was the time they took off from their normal preoccupations to arrange discussions and conferences on matters of mutual interest. Finally it is right for me to acknowledge with gratitude the financial help of the Akademiya Nauk and of our own Academy, and the admirable administrative arrangements set up by our Fellow Professor Piggott and Academician Rybakov for a series of exchanges between archaeologists of the two countries.

In what follows I can only attempt to focus on a small selection of topics of which the central theme will be that of the peopling of the north of the Eur-Asiatic land-mass. In order to set this problem in proper perspective it may be useful to recall the dimensions of the geographical background. From the borders of Poland to the Behring Straits the territory of the U.S.S.R. (Map I) is some 5,000 miles and 160° longitude; from north to south, from the Arctic Ocean to southernmost Uzbekistan in Central Asia, is 2,500 miles. Thus the total area represents about half the entire Eur-Asiatic continent. By comparison, it exceeds in area the entire North American continent north of the Panama Canal.

If we think of the extraordinary variety of civilizations and peoples concentrated, say, in Central and Western Europe in an area less than one-sixth that of the Soviet Union, the task of discerning any general features or trends in the prehistory of so vast a territory might well seem hopeless. Yet the two situa-

tions are not quite on the footing that dimensions alone might suggest. For the mosaic of contrasts between what one might call by comparison the micro-environments of the West, we have in Northern Asia and the contiguous part of European Russia a pattern of much smoother and more continuous ecological gradients. In general these are fewer in number and occupy greater relative proportions of the whole, shading gradually from the near desert of the steppes east of the Caspian, to the vast forested plains in the centre and north, and finally to the open tundra of the Arctic wastes themselves. East of the Lena, it is true, topographic relief is somewhat more marked, offering a series of mountain chains beyond the Verkhoyansk range, continuing virtually to the Behring Straits. South of this is again another, relatively smaller, area of more marked topographic diversification surrounding the Amur Basin. But for the rest the immense province of Northern Asia remains virtually unbroken from the Lena to the gates of Moscow and beyond, apart from the moderate barrier of the Urals. Nevertheless this last does serve in some sense as a natural frontier between Europe and Asia.

But a more significant boundary to human intercourse and movement must always have been along the southern marches of present-day Soviet territory, following the great series of mountain chains which begins at the Caucasus, continues eastwards through the Elburz and the more modest feature of the Kopet Dagh almost to meet the formidable wall of the Hindu Kush.[1] Thence in turn the mountains are virtually continuous with the Pamir, the Tien Shan, the Altai, the Sayans, the Yablonovy, the Stanovoy, and finally the Dzugdzhur separating the upper Aldan drainage from the Pacific.

In historic times at least it may be noticed that the pattern of human affairs seems to reflect this geographical setting to a significant extent. The migrations of the Tartars, the Mongols, the Turks are all cases in point resulting in the spread of ideas, languages, and human biological strains from the uttermost East far into the European West. Something of the same effect has long been recognized in the distribution of decorative patterns and other elements well documented in later protohistoric record. Sometimes indeed such elements spread further to the north-west into Europe, but in general they tend to phase out

[1] One of the few effective gaps in this southern barrier occurs between the Hazar-i-Masjid or southern extremity of the Kopet Dagh and the western outliers of the Hindu Kush near Herat, as shown by Lamberg-Karlovsky in his Reckitt Lecture of 1973.

somewhere in the region of the Urals. West of the Urals in European Russia proper, we begin to see a contrasted cultural distribution linking Russia to the West and Centre of Europe but seldom extending far to the East.

Although only a few years ago it would have been vain to search the scanty record of earlier prehistory for signs of similar patterns, today with the immense increase in published data and the growing interest in geographical distributions among Soviet prehistorians, may be the moment to look again. Somehow, at some time, mankind has spread over the whole of this territory from the near-tropical deserts of Central Asia to the northernmost Arctic and ultimately into the New World. What progress are our Soviet colleagues making towards an understanding of how and when this supremely important process in human history took place? What has already been achieved, what is in process of being investigated, and what remains to be tackled in the future with some hope of success?

In the first place we may recall that we have today an advantage unknown to workers of a generation ago, namely the growing corpus of absolute dates. It is these which enable us to study not merely static pictures of occurrence, as if whole areas of distribution were occupied all at one time, but by adding a time dimension to set the whole picture as it were in motion so that we can begin to see how it actually took shape. The implications of such a new dimension are indeed many. To take one obvious aspect it provides us for the first time with an objective criterion to test different possible explanations for regional and stratigraphical variation.

Such variations in style, technology, and economy can, in theory at least, be accounted for in a number of ways, ranging from pure geographical or environmental determinism to theories which include at least some element of diffusion and ethnic movement, or yet again, the internal dynamics implied by traditional Marxist thought. Ideally, I personally feel, all such alternatives should be considered in each particular case; none rejected simply because they have been in favour among an earlier generation of workers, or accepted simply because they are part of the latest trend in thought, but each objectively tested in the light of the latest factual results. In this task the addition of an absolute time-scale opens many paths to a more evidential and less dialectical assessment freed from preconceptions whether generated by archaeologists, mathematicians, or computers.

The importance attached by our Academy to the chronometric methods involved was shown by the emphasis on this very topic in the first joint meeting of the British Academy and the Royal Society in 1969. For the purposes of the present discussion two techniques are pre-eminent: radio-carbon for the last 50,000 years and K/Ar for the rest. To these we may, of course, add others of which the Uranium method[1] used on a number of occasions by our Soviet colleagues deserves perhaps more attention than it has hitherto received in the West. All have, of course, been greatly refined in recent years, especially in connection with independent methods of checking. These now range from straightforward stratigraphical sequence to such unexpected sources as terrestrial magnetism and the internal flow mechanisms of the Greenland Ice Sheet.[2]

A further advance of particular moment to Palaeolithic as opposed to later fields of prehistory is offered by the great strides currently being made in climatic history and ecology. To these of course the new chronometric data act as an indispensable link with archaeology. Two striking advances of recent years deserve special mention in this connection: the discovery that the ocean bottom contains a record of climate in many ways more reliable and complete than the traditional sources of terrestrial geology, and the long-awaited discovery of an apparently unbroken pollen sequence covering virtually the whole of the Pleistocene Ice Age.[3]

The impact of all these new frameworks on the prehistory of the Soviet Union, as of many other areas, is only now being fully realized. Nevertheless, a number of broad conclusions are already beginning to emerge with tolerable clarity. The pioneering work of Frenzel[4] and Mme Ivanova[5] have now finally disposed of an old misconception regarding the date of the end of the Mousterian and the incidence of the earliest Upper Palaeolithic in Russia. This is further confirmed (if confirmation were needed) by the mapping of sites of these two periods by O. N. Bader in a series of important papers over the last ten years.[6] The age of the crucial shift in human habits in question

[1] Cherdyntsev, V. V. (1971), for instance, quotes a number of results which compare closely with those of independent methods. See also Chard, C. (1965).
[2] See comprehensive treatment by Dansgaard, W. (1971).
[3] See van der Hammen, T., (1971).
[4] Frenzel, B. (1960).
[5] Ivanova, I. K. (1961) and (1972).
[6] Bader, O. N. (1972) and (1974), also (1965), (1967b), (1968).

is now clearly seen to be of the same order in Russia as in the rest of Europe, with only the minor local differences to be mentioned below.

But, apart from the individual problems of this kind, there is the still more significant development of the whole picture of climatic zoning throughout the territory during the latter part of the Ice Age which, taken with its newly published corollary in Siberia, forms a major factor in the human situation we are about to consider.

To the average Western European, nurtured in an artificial environment on stories (no doubt not without foundation) of the Russian winter, the major ecological factor for human distribution in Eastern Europe may seem to be temperature. Two important modifications of this point of view have recently been put forward. R. G. Klein[1] and a number of others have called attention to the ecological consequences of the spread of coniferous forest during the milder conditions of interglacials and interstadials. As a biotope it appears such forest is less favourable to animal and human occupation than the dry steppic plains of grass to the south or even the Arctic tundra to the north. The reason it appears is that the Arctic and steppic grass cover is formed of species highly nutritious for the larger ungulates and herbivores who in turn form the main food of man especially under Arctic conditions (for instance the diet of present-day Esquimaux). During interglacials like the present the ecological barrier of conifers according to some geographers would measure 500 miles wide in the North-West and no less than 1,500 miles wide from the southern Taimyr Peninsula to, say, the Sayan Ranges south of Baikal. Apart from the effects of human intervention, the main or most favourable area under present (interglacial) conditions would be the southern triangle of territory bounded roughly by a line from the Dnepr to the Ob basins and including Kazakhstan, Uzbekistan, and the Turkmenistan steppes. During the high glacials on the other hand a different factor would come into play, as has been pointed out by N. K. Vereshchagin (1971) in his recent study of frozen mammoth remains in the far north-east of Siberia. He has emphasized the ecological significance of lower precipitation at such times leading, despite the increased cold, to a substantial lessening of the snow cover and simultaneously to great reduction in the forest cover. Thus in effect, and at first sight surprisingly, the glacials actually enlarged the territory available for human occupation,

[1] Klein, R. G. (1971). See also Vereshchagin, N. K. (1974).

provided always that the necessary technological threshold had been reached, and that right up to the Arctic Ocean across areas now submerged by the rise in sea level. It will be part of my task to draw attention to some of the consequences which appear to be discernible in the archaeological record.

Finally, in the course of setting the scene for our discussion of human expansion northwards into the Soviet Union, it may be useful to pass briefly in review some of the latest discoveries outside the area. It is now widely accepted that the eastern savannah of Africa south of the Sahara offers the most convincing picture of human emergence we possess so far. Here the combination of a rich spectrum of homonid fossils coupled with the application of K/Ar dating displays a pattern of evolution towards man starting approximately 20 million years ago. By 3 million years ago a nearly man-like status had been reached in *Australopithecus* and perhaps other still more human physical forms. The correlated appearance at this time of worked stone artifacts associated with actual camp sites and food debris is a fact whose importance can hardly be over-emphasized. Among the highly variable artifact forms which then appear are some that characteristically combine a sharp edge produced by struck fractures with a natural or contrived hand-grip. These are the so-called 'pebble tools' that figure so largely in many discussions, including those of the Soviet Union.

This initial extremely primitive form of industrial activity lasted in East Africa down to some 1½ million years ago before it began to be replaced by more advanced tool forms with various ancillary elements, among them the so-called 'hand-axes' associated with the markedly more advanced anatomical strain of *Homo erectus* equipped with a brain of greatly increased size. Whether the anatomical advance preceded the behavioural, or vice versa, remains to be conclusively shown as far as East Africa is concerned, although there is no doubt that elsewhere the earlier form of material culture was still practised for long by *Homo erectus*. The earliest races of the *erectus* strain in SE. Asia would now appear to have arrived by at least 730,000±50,000 b.p.[1] in Indonesia (Sangiran, Java) associated with primitive pebble tools. The same tool types can probably be recognized stratigraphically below the hand-axe-bearing zone in the Indian Peninsula, where they are apparently of Lower Pleistocene date.

[1] Quoted for instance by Cherdyntsev, V. V. (1971), but later dates are discussed by Ivanova I. K. (1972)—between 510,000 and 690,000 with an average of 610,000 b.p.

The same order of age has been still more conclusively established at Kota Tampan in Malaysia.[1] The celebrated sequence at Chou kou tien just 800 miles south of the border of the Soviet Far Eastern province certainly covers a long duration which has long been assigned on palaeontological grounds to the subsequent Middle Pleistocene epoch, and has recently yielded uranium dates as late as 135,000 ± 18,000.[2] To complete the picture one may quote approximately dated finds of the same cultural or anatomical status in Western Europe (Westbury and Mauer), Central Europe (Verteszollos with a Uranium date 225,000, ± 35,000) and NW. Africa (Morocco ⩾ 200,000).

As for the subsequent industrial stage characterized by handaxes we now know that this was associated at first—both in East Africa and North Africa—with *Homo erectus*. By 640,000 ± 120,000 it was already present in Palestine in a somewhat archaic form, but it is not clearly attested in SW. Europe before 500,000. When it does occur, however, it is in a fully developed form in Italy and is not, as has been claimed, in archaic style. Thus once again Africa seems to be a source area on the basis of dating, and spread can reasonably be inferred thence to the north and east.

The third industrial epoch commonly known as the Middle Palaeolithic and associated with a further evolutionary advance reaching close to modern man and generally described as 'Neanderthaloid', represents once again a distinctive technological entity. Recent dating has however very much altered our ideas concerning its chronological position. In NE. Africa it has recently been shown that the cultural state is fully recognizable by 180,000.[3] In Europe the finds of Wernert at Achenheim in Alsace,[4] those of de Lumley in Provence,[5] and my own in the Channel Island of Jersey[6] can now correlate a comparable technological stage to the final phase of the Penultimate Glacial to which a date in the order of 150,000 can now be assigned with confidence on the basis of the evidence from deep sea cores.

Finally, we come to the emergence of men fully modern in all observable anatomical features, and indistinguishable from living groups. These manufactured tools identical to those of many isolated communities right up to the ethnographic present, using techniques that have been actually observed in action and contrast sharply with those in vogue among the preceding popu-

[1] Sieveking, A. (1958).
[2] Chard, C. (1965).
[3] Wendorf F. (1975).
[4] Wernert, P. (1957).
[5] de Lumley, H. (1969).
[6] McBurney, C. B. M., and Callow, P. (1971).

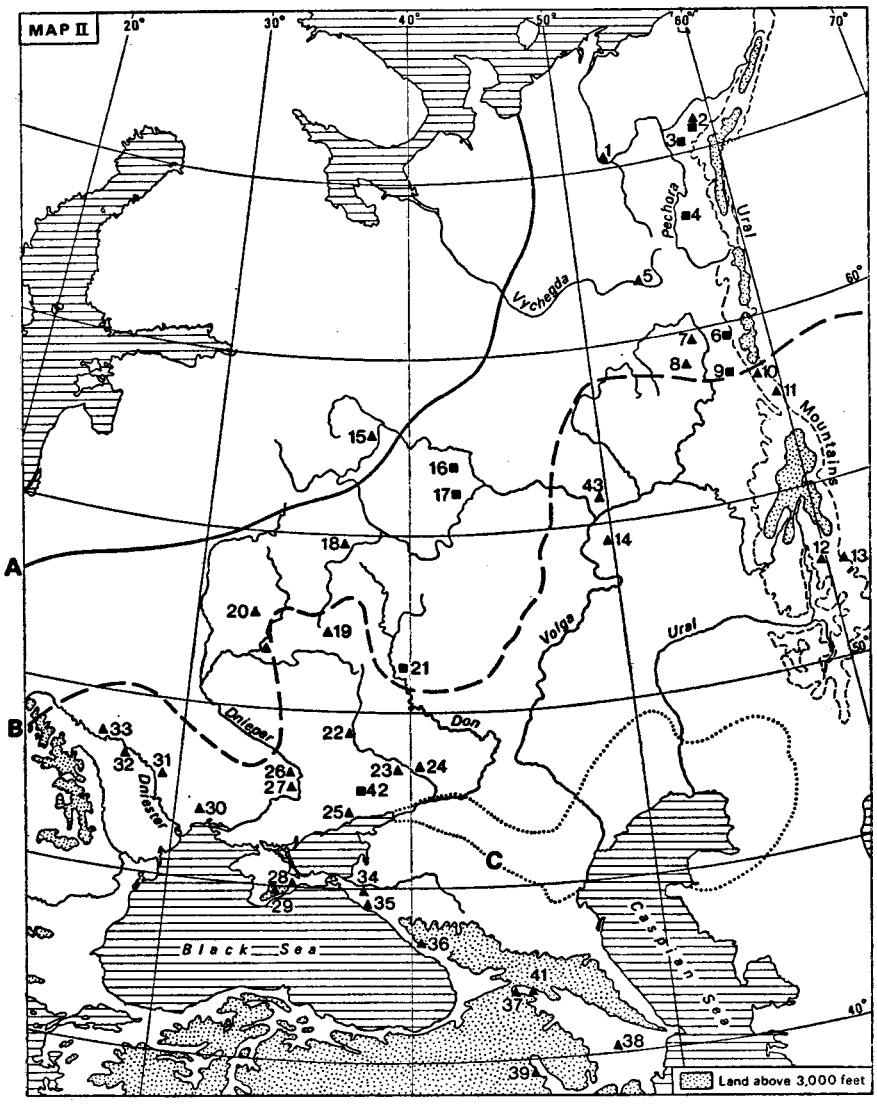
lations of generally Neanderthaloid type. It is important to realize that not merely were new practices and forms introduced but earlier features were very rapidly abandoned, in many cases demonstrably within 1,000 years. It is further extremely interesting that many other behavioural traits characteristic of contemporary men can also be seen to make their appearance at this time. Such are the first traces of art, the manufacture of carefully shaped and standardized objects of bone and antler, and the appearance of pure decoration—all features unknown in Middle Palaeolithic industrial contexts of the earlier period.

The meaning of this watershed in the cultural and biological evolution of man is not yet clear and largely outside the scope of this paper, but the date has a direct bearing on a number of problems connected with the peopling of the U.S.S.R. The latest chronometric readings present a significantly different picture from that accepted only a few years ago. Thus there is now substantial evidence that the change took place in the Balkan Peninsula *before* 40,000 b.p. and only very shortly afterwards over a wide zone from the Pripet Marshes to the British Peninsula (as it was then) whereas, contrary to what used to be believed, there is no evidence of the kind in SW. France before 35,000—i.e. 4,000 to 5,000 years later. There are moreover positive indications for the survival of typical Mousterian right up to that time in France, if not later.

Outside Europe the earliest dates for the Upper Palaeolithic so far made available have come from the East Mediterranean and adjacent regions of Eastern Libya and Western Iran, and very shortly afterwards (by or before 34,000) in the Amu Darya Basin of North Afghanistan. Farther east again, although there are no data as yet from India, the presence of modern Man is attested by 39,000 at Niah in Borneo, and on the latest evidence by 40,000 man (presumably *sapiens sapiens*) appears in Australia.[1] As against this a time-lag similar to that between Central and SW. Europe has now been registered in North Africa between Libya and the Maghreb, and between the Lower and Upper Nile.

All in all, it is now virtually certain that the emergence of anatomically modern man and his characteristic cultural behaviour patterns, so far from being the simultaneous event postulated only a few years ago, now shows very distinct signs of progressive spread from a limited number of foci. Of these the earliest on present evidence lay somewhere in SW. Asia close to

[1] Personal information from Professor D. J. Mulvaney.



MAP II. European Russia in the Upper Pleistocene. A selection of some important Middle and Upper Palaeolithic sites. Line A indicates the SE. limit of the Last Glaciation, and B the maximum extension of the ice in previous glaciations.

1. Kruchei
2. Krutaya Gora (two layers Upper Palaeolithic and Mousterian)
3. Bisovaya
4. Medvezhiya (Bear Cave)
5. Ust Kulom
6. Blisnietsova Cave
7. Sludki
8. Gremyatski
9. Taliski
10. Peshcherniya Log
11. Stolbov Cave
12. Urta Tube
13. Smelovski Cave
14. Krasnaya Glinka
15. Altinovo
16. Sunghir
17. Karacharova
18. Group of sites on the Oka
19. Zolotarikha
20. Kamennaya Gora
21. Kostienki—Borchevo
22. Shubnoe
23. Krasni Yar
24. Derkul
25. Rozhok
26. Kruglik
27. Berdish
28. Kiir Koba
29. Group of Volci, Chokurcha, Shaitan, etc.
30. Ilinka
31. Vykhvatinski
32. Group with Babin
33. Group with Pechorna
34. Ilskaya
35. Smolenskaya
36. Yashtukh with others
37. Lashe Balta and thirty other sites
38. Azykhskaya Cave
39. Satani Dar
40. Mezin
41. Kudaro
42. Amirosiaka
43. Mysy

SW. Palestine and another (or possibly an offshoot of the first) lay in the Balkan Peninsula.

Turning now to the U.S.S.R. it may be useful to start our discussion with the region closest to the West and to the scene of the pioneering researches into East European prehistory, namely European Russia (Map II). Nearly forty years ago, when Dorothy Garrod sat down to write her classic study of East and West European relationships—'The Upper Palaeolithic in the Light of Recent Discovery'—the number of Soviet sites known to West European scholars scarcely exceeded a few score. O. N. Bader gives the total twenty years earlier in 1917 as fifteen sites. By 1972 not less than 800 were on record and today the total surely exceeds 1,000. While I was visiting the section at Leningrad I had the pleasure of meeting (if I remember rightly) fourteen full-time specialists working in my field in that one unit alone, all actively engaged in original field work and analysis.[1] It is thus clear that in making use of the abundant distributional data now available we must make due allowance for this striking concentration of effort. Nevertheless we must also, I feel, avoid actually over-compensating and so misinterpreting what are indeed genuine underlying realities in the prehistoric situation which are beginning to emerge. It is, for instance, surely clear by now that SW. France, far from forming in any sense the centre of human activity at the time, lay far out on its periphery. Familiar categories like Aurignacian, Gravettian, Solutrean, Early and Late Magdalenian in their French sense are but local expressions of a far larger whole only now being revealed. The rich harvest of the Soviet Union compels a real shift in our whole conception of the Palaeolithic state of man, and I believe that this shift is not simply one of weight of numbers, but includes much that is qualitatively new.

In 1937 one of the great difficulties that Garrod encountered in her attempt at synthesis was the lack of multi-level sites by which stylistic successions in Russia could be established on a secure stratigraphical basis. Such sites were familiar in the West for the simple reason that the majority came from caves where repeated occupations were inevitably superimposed. In the flat or rolling plains of Eastern Europe on the other hand, the majority of sites, although in the strictest sense closed finds,

[1] P. I. Boriskovsky (1970) has recently summed up the position thus—'There is in the U.S.S.R. a great quantity of scholars studying the Palaeolithic. Among them there are many young and able men. Their investigations embrace a variety of territories in different parts of our country.'

represented what were originally isolated open encampments, in many cases quite possibly visited only for a single season or even a few days. Yet it is important to bear in mind that both sorts of find have their indispensable roles to play in interpretation. If successions were at first hard to establish in Russia, yet the isolation of the products of a single group or family of hunters from those of other groups at a moment of time was made infinitely easier. Indeed, the modern study of cave infillings with multiple C14 readings down the stratigraphical columns have shown that in many cases these sites far from being the 'home bases' imagined by some of our colleagues were, despite their apparent richness in remains, when actually reduced to time units little more than the venues of chance visits used on an average of a few days at a time at intervals of as much as ten to fifteen years.[1] It is in fact the open sites that give us the most informative picture of what life was really like at the time.

On the other hand long-term successions are equally indispensable if we wish to contemplate the broad picture of cultural evolution, and furthermore if we wish to understand something of the actual functioning of the individual elements we recover, as I have recently tried to show with the aid of suitable statistical techniques.[2]

The bulk of the sites in European Russia are in fact concentrated in the area between the Don and the Polish frontier, bounded during the Valdai (Last Glaciation) by the Scandinavian Ice Sheet to the north-west. Present-day surveys (as opposed to those of only a few years ago) now place the margin of this feature along a line curving away from an eastwards direction gradually northwards so as to meet the Barents Sea just north-east of Archangel. Thus a corridor is now seen to have been opened between the ice sheet and the Northern Urals, giving direct access to the Arctic Ocean throughout the Valdai epoch.[3] The main locus of occupation was, however, as far as present evidence goes, in the south-west portion of the territory, occupying some 500,000 square miles.[4] This relatively densely populated region[5] in South Russia is linked by intermediate

[1] See for instance McBurney, C. B. M. (1971), also Wahida, G. (1975).

[2] McBurney, C. B. M. (1973).

[3] Bader, O. N. (1972).

[4] By comparison this is an area some twenty times greater than that of the Garonne Basin in SW. France where so much of the early work on the Palaeolithic took place.

[5] Beregovaya, N. A. (1972). See also Chernysh, A. P. (1959). Pidoplichko (1969) estimates the number of known sites in the Ukraine alone at 500.

sites southwards to the Lower Danube and westwards along the northern fringe of the Carpathians to the Middle Danube and the Central German Highlands, and thence ultimately to the Atlantic seaboard.

Broadly speaking the distribution of the preceding Mousterian finds (mainly it would seem of earlier Valdai date) is similar, but the great scale of Russian information now indicates a difference in one important respect. Although the finds occur in the same geographical territory they are very considerably thinner on the ground.[1] Nor can we easily explain this as due to factors of preservation, nor is there, yet again, any indication that the Mousterian occupation of South Russia was of any shorter duration that than of the Upper Palaeolithic, rather the contrary. The readiest explanation as things stand would seem to be quite simply that Mousterian technology gave a substantially lower yield in this environment of food per acre, and hence could only support population at a significantly lower density than was made possible by the greatly improved technology of the succeeding epoch. Just how impressive this last became we shall have occasion to see shortly.

In a review of the latest evidence regarding the general character of assemblages of Upper Palaeolithic form and later Valdai date in Russia, the first point that stands out is that the affinities with the SW. French succession, traditionally stressed by workers in Eastern Europe, are in fact far more limited than used to be supposed. In France the succession originally outlined by de Mortillet nearly a century ago and corrected by Breuil is still essentially valid and indeed amply confirmed by current C14 readings. In round figures it may be summarized as follows: Aurignacian (and Chatelperronian) 35,000–28,000 b.p., Gravettian 28,000–21,000, Solutrian 21,000–17,000 (or possibly 19,000), Early Magdalenian (I–III), 17,000 (or possibly 19,000) –14,000, Late Magdalenian (IV–VI) 14,000–12,000 b.p. In North and Central Europe the Aurignacian and Gravettian are significantly earlier with the Aurignacian (and its contemporary the Szeletian) forming the initial stages of the upper Palaeolithic, and the Gravettian emerging *circa* 31,000 b.p.[2] Moreover, the Solutrian and earlier stages of the Magdalenian are here replaced in the local succession by the continued presence of Gravettian in a more developed form (as for example in Italy and Greece)

[1] The first to draw specific attention to this fact as far as I know was R. G. Klein (1973), but see also Vereshchagin, N. K. (1974).

[2] See for instance Felgenhauer, F. (1958).

and only the barest trace of the final stages of the terminal Magdalenian are to be detected in a fringing and modified variant in Austria, Czechoslovakia, and possibly Poland.

In Russia the situation is different again. It can be followed for instance in two out of the now fairly numerous stratified multi-level sites from the Dnepr and Don basins. The most complete of these, and probably the most complete succession of this kind so far discovered in the Soviet, is at the site of Molodova V on the Upper Dnepr. Here A. P. Chernysh in a famous excavation uncovered no less than fourteen superimposed occupation levels dated by seventeen C14 readings.[1] A duration of occupation from $\geqslant$46,000 down to 10,590$\pm$800 b.p. is thus indicated. Correlation between depth and age in this profile is extremely high ($r = 0{\cdot}96$) which means in effect that any irregularities that occur are well within experimental error, a point which seems to have escaped some commentators. The regression formula is closely linear, and we can accordingly interpolate the date of the earliest certainly Upper Palaeolithic horizon with some confidence at 31,000 b.p. In the wide hiatus between this and the nearest underlying horizon of undoubted Mousterian character there is a disputed intervening level (Xa/Xb) which the excavator assigns to the Mousterian also, but which W. Chmielevski who has also studied the material regards as Upper Palaeolithic.[2] This dates to 35,000.

Elsewhere in Russia the oldest Upper Palaeolithic for which a direct date has been obtained is at Eliseevici near Bryansk, with a dating of 33,000$\pm$400 b.p. (GIN 80). This is a little disconcerting at first sight in view of the presence of a typical Venus figurine and a developed style of geometric (net pattern) ornament (Plate I). Both are elements which are not elsewhere positively known before 28,000 (in Central Europe). The association was questioned at the 1969 Congress of Pre- and Protohistoric Sciences, but W. Chmielevski (personal communication) who knows the site at first hand believes it to be correct. Be that as it may, the dating evidence as far as it goes for Middle/Upper Palaeolithic interface in European Russia appears thus to be of the same order as that of SW. France, and to show that both are significantly later than in Central Europe. As already remarked the first stage of the Upper Palaeolithic in Central Europe is of Aurignacian and/or Szeletian type, both assemblages unknown in typical form in Russia.

[1] Klein, R. G. (1973) quotes full bibliography.

[2] Personal communication.

In their place, as Garrod pointed out long ago, are varied expressions of what on morphological grounds may be classed as 'Gravettian'. The lithic characteristics of this group in Russia (as indeed in the area of first identification in SW. France) are subject to considerable variation;[1] none the less as R. Hodson has shown quantitatively[2] they cluster statistically to form an entity widely divergent from others in SW. and Central Europe. By this I do not mean to imply that variants at a lower level of differentiation may not yet in Russia, as elsewhere, prove to be culturally significant. On the contrary, once these last have been more fully investigated, mapped, and statistically analysed, we may expect to learn much more of their meaning. But what I would like to emphasize at the moment is that the more general lithic taxon comprises not merely distinctive features of lithic equipment but, in addition is associated with a wide range of additional features. These include specialized bone and antler products, stylistic features of both representational and non-representational character in art, and even, as has been recently suggested, a form of numerical record or tally. All these and many others combine to offer evidence of a cultural nexus or complex of overlapping units showing a remarkable degree of continuity throughout a wide range of space and time from the Atlantic to the Don Basin and lasting in some places around 20,000 years. The Russian sector of occurrence alone occupies about a third of the total area.

One of the newer aspects of this emerging picture to which I should like to draw especial attention concerns the ecological rather than the directly industrial side of life. It has long been known that the basis of communal life at this time rested on the hunting of a variety of large mammals, including at first dominant horse (changing later to dominant reindeer) with substantial numbers of mammoth and elk (replaced to some extent later by red deer and varying proportions of bison). The bones of these animals are gathered in enormous numbers in and around the settlement traces. In the early days of investigation such piles were thought of merely as accumulations of discarded food debris. P. P. Efimienko, one of the poineers of Old Stone Age archaeology in the U.S.S.R., was the first to carry out integral excavation of such sites and to show that the occupation took the form of a patterned settlement similar in layout (if not necessarily in construction) to some of the so-called Long

[1] See for instance Kozłowski, J., and Kozłowski, S. (1975).

[2] Hodson, R. (1969a) and (1969b).

Houses observed among the aboriginal Americans, for example. These palaeolithic settlements appear to have housed up to ten or more social units, presumably separate families. Similarly patterned settlements have been identified at many other sites in the Don valley and elsewhere in South Russia. Until recently, however, very little could be deduced except in the most general terms regarding the actual construction and superstructure of such dwellings.[1] This gap in information has now been brilliantly filled by the work of I. A. Pidoplichko and I. G. Shovkoplyas and their associates at Kiev. By a combination of good conditions of preservation plus meticulously careful excavation, they have been able to reconstruct in convincing fashion dwellings made almost wholly of mammoth bones, at a time when suitable wood was rare or lacking.

Naturally the task presents many difficult technical problems. When first exposed the remains give the appearance of disordered, approximately circular heaps of bones (Plate II(a)). As they are uncovered during excavation the individual bones are separately numbered and their relative positions are carefully recorded. Then, as the heap is gradually dismantled piece by piece, it is found in many cases[2] that the internal structuring displays repeatedly that particular types of bone occupy specific relative positions. Thus mammoth mandibles are often inverted, fitted together, and arranged in a circle to form a foundation or outer limit. Tusks, judging by their collapsed position, may have been used to form a framework for a porch or entrance (Plate II(b) and (d)). On some occasions they are even joined together with a sleeve; alternatively they are left in their sockets in the skull and it is the latter that are so arranged as to form concentric roof supports.

The roof covering itself is deduced to have been made of hide held in place with bones as weights and the whole structure must have had a general resemblance to the whale-bone and hide *Yaranga* type of hut still made until recently in parts of NE. Siberia.[3]

A single central hearth or pair of hearths is a usual feature of the interior. Finally, the general distribution of flint debris and miscellaneous discarded objects often shows a clear concentration within the limits of the deduced structure. These

[1] See for instance discussion by Grigoriev, G. P. (1967).

[2] Notably at Mezhirich near Kiev but also at many other places—see below.

[3] Pidoplichko, I. A. (1969), p. 16.

small finds have moreover considerable intrinsic interest from several points of view. Thus, at Mezhirich for instance, there is evidence for exchange or transport of goods over considerable distances.[1] Carved objects of amber (including what look like feminine figurines in a schematized style) and fossil shells known to have been brought from 350 to 500 km away are examples.

Habitations associated with the same type of Gravettian lithic typology in the Don valley provide evidence for the importation of exotic flints and other raw materials over comparable distances so that regular intercourse on a significant scale seems well attested.

Outside the houses, especially at the famous site of Mezin[2] (which has been re-excavated by modern techniques with great success) there are in some cases signs of a regularly patterned grouping of storage pits containing bones, together with smaller structures of unknown significance, but possibly huts with a particular function. A similar feature occurred not far away at Dobranichevka (Plate IV(a)). In this connection a recent discovery may possibly be of relevance. In one of the huts at Mezhirich was found a remarkable mammoth skull painted with a bold geometric pattern (Plate III(b)). Although in a somewhat damaged state it showed, in addition to the ornamentation, curious marks or small contusions as if it had been hammered or drummed on. The latest information is that certain long bones with rounded ends show complementary marks, and the suggestion is that the skull was indeed a drum used for musical purposes. If I understand correctly this or a similar specimen has been found in a hut largely lacking living debris so that the possibility is raised that some huts were made specially for purposes other than living, and somehow connected with the practice of drumming.[3]

All in all it seems highly likely that as our Soviet colleagues pursue their researches, and these and other observations of a like nature are checked and co-ordinated, we shall have considerably more vivid and suggestive pictures of the meaning of the structural details of Russian Upper Palaeolithic settlements. No direct carbon date for the sites excavated by the Kiev team have yet been made available to my knowledge, but an interesting

[1] Pidoplichko, I. A. (1969).

[2] Shovkoplyas, I. G. (1965).

[3] For this most recent information which came to my notice subsequent to my visit I am once again indebted to personal information from W. Chmielevski.

Uranium date is available for the key site of Mezin, namely 21,600±2,200 b.p.

A further consequence of this new work on the dwellings of the SW. Russian Upper Palaeolithic is the extension of the results to other regions less favoured from the preservational point of view, or less skilfully investigated in the past. Among the former are recent field results from the classic area of Kostienki on the Don. Here P. I. Boriskovsky has recently made known results of an excavation at the site of Anosovki (Plate V) where strikingly similar traces of construction can be recognized despite the disturbance introduced by subsequent cryoturbation due to permafrost conditions at the height of the Last Glaciation. Comparable but more disturbed traces can perhaps be recognized as far away as Cracow in Poland (the Spadzista Street site), and the same indications may well be detected at many other sites in the West in due course.[1]

This brings us to the twin problems of the time and space dimensions of the Gravettian complex (in the widest sense of the term) and also to some of its more narrowly defined cultural expressions. The latter include the variant best exemplified at Kostienki I Layer 1. Many of the industrial and artistic characteristics revealed here have now been recognized over a thousand miles to the west, while yet others again occur as far away as SW. France. Unfortunately the dates obtained so far for the stratified sequences at Kostienki itself are not internally consistent, and consequently cannot be taken quite at their face value. The most reliable C14 series is still that of the two sites at Molodova on the Dnepr where a similar (but not quite identical) assemblage dates to 23,700±370 b.p. By comparison the closer parallel at the Spadzista Street site in Poland dates to 23,040±170, but the reading from Kostienki itself is only 14,020±60. Thus if we accept the last dates as at least approximately correct we might not unreasonably think in terms of an original more westerly centre of dispersal for this complex. As far as present evidence goes, the same could well be true of other variants also of the complex as broadly defined.

This point is not, I suggest, without substance if we now turn to the problem of the total geographical distribution of the Gravettian. As things stand at the moment, the Don Basin marks the easternmost known limit of what is, in effect, an essentially

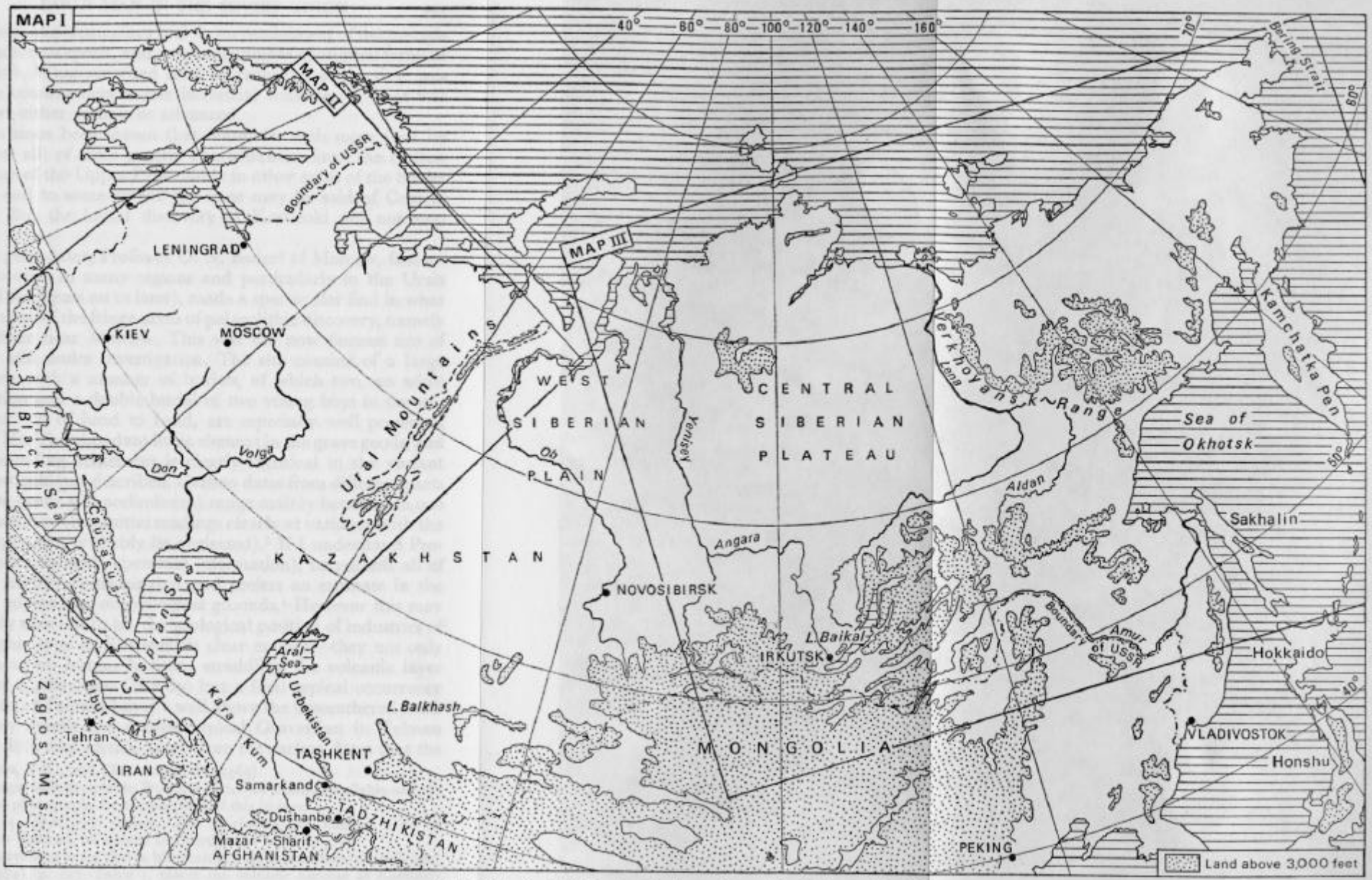
[1] The majority of the dwellings so far recognized in the West have been of quite different construction, like those of the Magdalenian at Pincevent (A. Leroi-Gourhan and M. Brezillon, 1972).

western cultural expression; but what can we say of its possible extension to the north, south, south-east, and the nature of its relationship to contemporary practices and societies away to the east in Asia? A variety of more or less speculative opinions on this subject have been offered from time to time over many years past, but it is only quite recently that direct data relevant to this question have begun to be available.

One of the first points arises indeed from the multi-level stratigraphy at Kostienki itself. Here correlation between different sites, and different levels between sites, is facilitated by the presence of two separate terraces, and the sub-division of the upper (and hence earlier) terrace by a well-defined pumice-bearing horizon of volcanic origin (probably from a short-lived eruption in the general area of the Caucasus).

The results of the stratigraphy established by these means shortly after the war were at first so surprising both to Soviet and Western specialists that our late Fellow Gordon Childe, who was the first to make these particular results known in this country, entitled his paper 'The Kostienki Scandal'. He gave his paper in Cambridge in an inn, much frequented by students of his own political persuasion, and perhaps not inappropriately called 'The Red Cow'. The occasion was a little chaotic, as I remember. The slides broke down, the Professor was obliged to reset them and the late Sir Ellis Minns, who was presiding, indulged in some characteristic comments. Nevertheless, the essence of Childe's theme was not lost upon us. Instead of the supposed 'classic' sequence of SW. France that many still expected, what was revealed was a clear reversal of that sequence with the 'Solutrean' preceding by a substantial period its expected *successor*, the Gravettian. Thus, the long hallowed de Mortillet/Breuil scheme had to be abandoned once and for all in its application to Russia, a conclusion later amply confirmed by stratigraphy and C14 over a wide area.

Instead what had been brought to light for the first time was a hitherto unsuspected and highly original expression of the Upper Palaeolithic. Contrasting in almost every feature with the Gravettian, it was characterized in the first place by a distinctive category of spearhead and knife blades trimmed on both faces by a pressure technique (which had, of course, led to its original mis-identification as 'Solutrian') and including such sophisticated forms as hollow-based triangles hitherto unknown before the late holocene. These traits were combined with an otherwise remarkably archaic-looking level of lithic



MAP I. The Soviet Union showing the positions of detailed maps II and III

technology and elementary tool forms reminiscent of the preceding Mousterian epoch, and a certain number of original forms of bone tools. What surprised most investigators at the time was just this combination in one industrial tradition of what was elsewhere either archaic or advanced.

It has since been shown that industries with some (but by no means all) of these general characteristics form the earliest expression of the Upper Palaeolithic in other areas of the Soviet Union[1] and to some extent the same may be said of Central Europe. But the initial discovery at Kostienki did not stop there.

Some years later, Professor O. N. Bader[2] of Moscow, famous for discoveries in many regions and particularly in the Urals (which I shall pass on to later), made a spectacular find in what was then one of the fringe areas of palaeolithic discovery, namely at Vladimir near Moscow. This was the now famous site of Sunghir still under investigation. The site consists of a large settlement with a number of burials, of which two, an adult inhumation and a double burial of two young boys in the unusual position of head to head, are especially well preserved (Plate VII). The abundant lithic element in the grave goods, and the surrounding settlement is clearly identical to the variant from Kostienki just described. Carbon dates from different parts of the site (some still preliminary) range mainly between 20,000 and 26,000 b.p. (two initial readings clearly at variance with the stratigraphy can probably be neglected).[3] If I understand Professor Bader correctly (personal information), he regards all of these as slightly contaminated and prefers an estimate in the order of 30,000 b.p. on geological grounds.[4] However this may ultimately turn out to be, the geological position of industries of the Sunghir type at Kostienki is clear enough—they not only fall within two humus horizons straddling the volcanic layer (dated at 23,060±300 GIN 89) but a final typical occurrence is recorded at Telman Layer 1 well above the unweathered loess. Here they overlie the earliest typical Gravettian in Telman Layer 2. It is thus certain apart from the carbon dates that the

[1] Ivanova, I. K., and Chernysh, A. P. (1963).

[2] I am especially grateful to Professor Bader for making available some of his original photographs for the purposes of this lecture.

[3] GIN 14 14600±600 (bone), GIN 15 16200±400 (humus), GIN 16 20540±120 (humus), all quoted in Cherdyntsev V. V. (1971).

[4] It is interesting to see that in his recently published summary Grichenko, M. N. (1974), p. 127, Table 1, places the volcanic horizon at Kostienki associated with the same variant, at over 30,000 b.p.

two variants overlap in time in the same area. This surely disposes of any simplistic explanation of the cultural dichotomy on functionalist lines: not only is the Sunghir assemblage practised both in interstadial and stadial conditions, but the same also applies to the Gravettian. A more rational hypothesis is simply that two separate communities, characterized by contrasted traditions of material culture, competed over several thousand years of the Main (Pleniglacial) Würm for the exceptionally favoured ecological niche that was constituted by the Kostienki–Borchevo escarpment (Plate V(a)).

Returning to the nature of the Sunghir finds the most striking grave goods are of organic material especially bone, ivory, and antler. Of the two graves the richest assemblage was yielded by the grave of the two boys. Each had lying beside him several heavy spears of mammoth ivory of a form and size unique in Palaeolithic records. These were straightened (since mammoth tusks are characteristically curved) by some ingenious method not yet duplicated in the laboratory. Among additional features are a series of staves of unknown purpose, daggers, long bodkins apparently used for fastening the clothes at the neck, pierced batons of a new form decorated with drilled ornament and two pierced discs, one decorated with drilled ornament again and one in a remarkable open-work technique found resting on one of the spears. Mobiliary art includes small carvings pierced for suspension of antelope, (?) bison, and mammoth in a style not exactly repeated elsewhere (Plates VIII–IX). Round the upper arms of the adult were ivory bracelets of strips pierced at the extremities apparently so they could be tightened round the arm with laces of some kind. It is interesting that almost exactly the same device occurred at Mezin at about the same time if the Uranium date is to be trusted.

Finally, a particularly interesting feature was the presence around the bodies of some 8,000 pierced ivory beads. When I was in Moscow these were being individually recorded by a remarkable technical process involving the removal of the entire burial intact to the laboratory in a monolith weighing several tons. Initial results of the plotting showed that the beads were by no means randomly scattered and afforded by their arrangement interesting indications of dress, on the assumption that they were sewn on to leather garments like the *Wampum* of the North American Indians (Plate VII(a)).

One of the first conclusions of this remarkable find, apart from the revelation of the technological sophistication of the group

involved, was the extent of their geographical range—up to 500 miles further north than previously known. More was to follow.

With this point in mind we may now pass on to the situation revealed by many years' work but recently much amplified, in the 'ecological corridor' I have referred to between the Scandinavian ice sheet and the Urals (Map II). I understood from Professor Bader, who has made a special study of this very territory, that a total of some twenty-eight Upper Palaeolithic sites are now known from there (and perhaps half that number of Mousterian sites in addition). Although none has been dated by C14 as far as I know, all are clearly Pleistocene on the basis of their associated fauna which regularly includes mammoth and rhinoceros as well as the usual suite of other Pleistocene species. Many of the stations, it is true, are too poor in yield of specimens for close archaeological diagnosis, but a few are sufficient to afford some interesting and unexpected indications. Of these last collections I was able to examine two in detail (through the kindness of Professor Bader) which have been the subject of special attention in the U.S.S.R. since they are held to show features which fall outside the normal range of variation of contemporary assemblages of Gravettian to the south-west. The sites I studied were Blisnietsov and Taliski, both from the central sector of the Urals north of Perm. As suggested many years ago (in connection with Taliski in particular by C. N. Zamiatnin) they show significant points of resemblance to the vast group of Siberian finds stretching away to the east of the Urals, to which I shall allude later. The resemblances include among other features the presence, for example, of small to truly microlithic end-scrapers in characteristically large numbers, balanced by rarity or absence of the characteristic backed-blades of the Gravettian, and a highly developed technique for the production of unretouched microlithic bladelets of great regularity, coupled with a strong element of coarse flake and core tools.[1] The micro-blade technique is particularly interesting since, as we shall see, it is linked over much of Siberia to slotted bone points from a much earlier period than used to be supposed. One such point with the micro-blades in place in the slot was found nearly intact at Taliski (Fig. 1 no. 9).

Finally, an interesting biological link with Siberia was provided by the presence of *Capra sibirica*, a species not known further to

[1] See Bader, O. N. (1972) 'Diese Besonderheiten weisen darauf hier, daß das Jungpaläolithikum des Urals und des westlichen Vorgebirges des Urals zur sibirischen Kulturwelt gehört.'

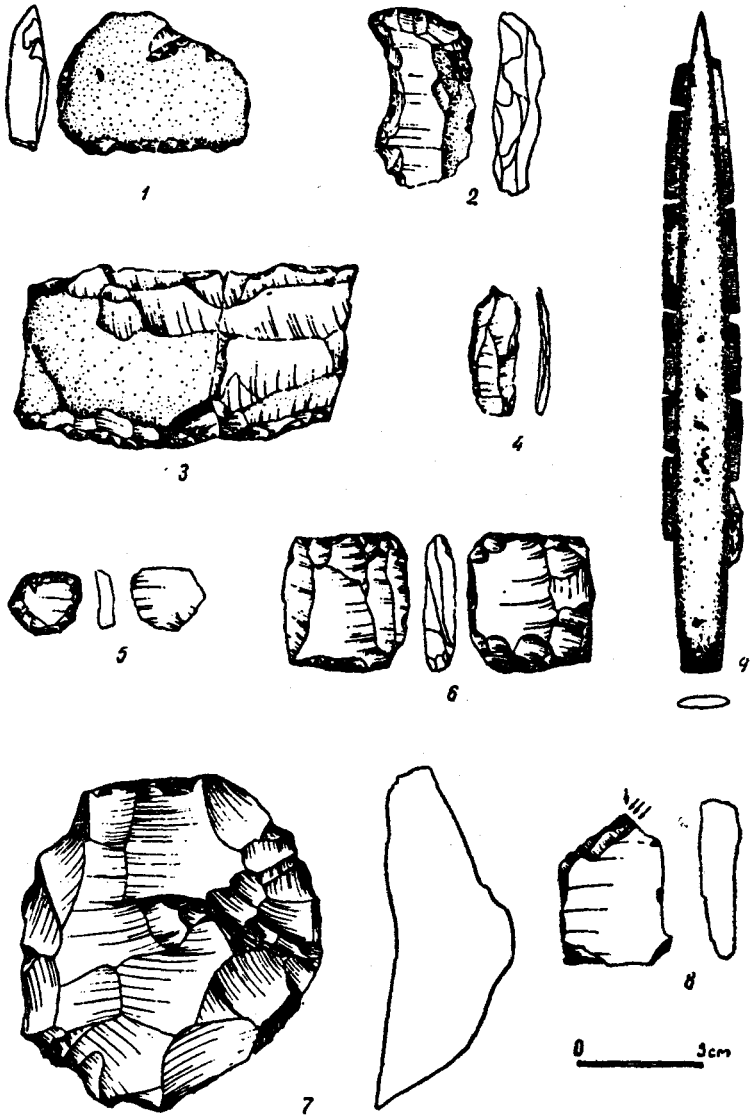


FIG. 1. Selection of implements from Taliski (Ural region). Note macrolithic side-scrapers, 1, 3, 7; microlithic thumb-nail scraper, 5; micro-blades mounted in slotted bone point, 9; all regarded as elements of Siberian affinities. (After O. N. Bader (1965).)

the west but an important source of food in contemporary communities in Central Asia. Further living species of Siberian affinities are found to the south as far west as the Volga.

Hitherto, I suppose, the find best known from this area among Western scholars has been the painted cave of Kapovaya (or Shulgan Tash), still the only known example of palaeolithic cave

art in the U.S.S.R. This was yet another of O. N. Bader's remarkable contributions to the prehistory of his country while he was working at the University of Perm. Although the paintings are not outstanding for their preservation they are quite recognizable and allow adequate readings to be established as can be seen from the direct photograph (Plate XII) made available for this paper by Professor Bader. Perhaps inevitably they were immediately assimilated by Western scholars to the well-known corpus of Western Palaeolithic art. But it is not always realized in the West that this was not the view expressed by the finders. If one abstracts the resemblances due simply to the fact that they are drawings of similar creatures—i.e. mammoth, rhinoceros, horse, (?) bison,[1] and hence reproduce the main visible characters of these animals, the question of purely stylistic resemblance is another matter.

It will be recalled in this connection that the stylistic resemblance between the mobiliary art of the Don Basin (and other regions of SW. Russia) dated 25,000 to 15,000 b.p., and contemporary sites in Central and Western Europe detail for detail is quite remarkable. The same, according to Bader and his coworkers, is not true of Kopovaya. Although stylistic comparisons at this level of art are an extremely delicate matter, I must say that I find the arguments put forward to this effect worthy of more serious consideration than they have so far received in the West. Among other features I might instance the treatment of the head and forequarters of the elephants which often assumes a radiating form without parallel in the West (Plate XI), the idiosyncratic expression of the rhinoceros, and to some extent the treatment of the legs and hind-quarters of the elephants, and what I take to be a bison (Plate XII(b)), which all incline me to accept this point of view. Whether the idea of this proposed differentiation of the Kapovaya productions from the Western art style can be further amplified so as to indicate positive affinity with Siberian art styles is of course another question.[2] My personal impression, for what it is worth, is that our knowledge of the latter is still too incomplete to make a worthwhile suggestion, although it may at least be said that these last show characteristics still further removed from those of the Gravettian.

[1] This reading is tentatively put forward by the writer.

[2] Bader notes that although their position (300 m. from the entrance) and subject-matter resembles Western occurrences they 'unterscheiden sich aber von diesen durch ihren Stil' and compares them with the engraved mammoth from Maltá (Plate XVI).

The industrial resemblances between such sites as Taliski and Blisnietsova and the Siberian complex is not, however, the only set of outside affinities detected in the Upper Palaeolithic sites of Uralia. Two, in particular, offer evidence of a totally different cultural enclave; they are in fact unmistakably linked to the Sunghir complex far to the south. They are also noteworthy in

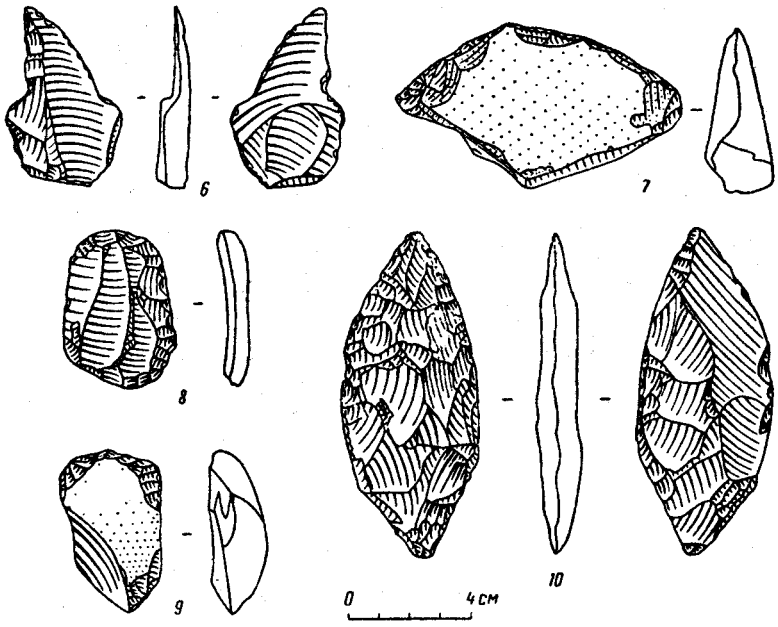


FIG. 2. Selection of tools from Bisovaya Upper Palaeolithic site on the Pechora. Note presence of side-scraper and other broad elements associated with leaf-point in flat bifacial technique. A 'U'-based triangular point of Sunghir type has also been obtained (not illustrated).

that they are the northernmost Upper Palaeolithic finds in Europe and provide the only proof of penetration of the European Arctic at that time. They come from the region of the Pechora river nearly 65° north and show the same highly distinctive bifacial missile heads worked in pressure technique to produce both the leaf-form and the hollow-based form of head, coupled with the same crude technique for auxiliary tools, which are none the less of certain Upper Palaeolithic type (Fig. 2). One of these sites—Bisovaya—shows a further very interesting feature in the presence of polar bear among the food debris. This demonstrates direct access to the Barents Sea. The other site, Krutaya Gora, has an earlier occupation level with Mousterian showing the detailed characteristics which link it to sites

far to the south on the Volga such as Suchaya Meshetka. Other Mousterian sites occur in the same region—at Korovyi Ruchei 150 miles downstream on the Pechora and Ust Kulom on the Vichegda.

These new northern finds add a quite new dimension to our picture of the European Middle and Upper Palaeolithic. The Sunghir variant for instance covers nearly twice the territory that originally appeared. It can hardly represent other than a technological, ecological, and sociological entity of outstanding importance since it retains its individuality over some 1,500 miles from the Black Sea hinterland to the Arctic Ocean, during the interval 20,000 to 26,000 b.p. at the height of the Last Glaciation. Stylistically and ecologically it contrasts in almost every way with the contemporary Gravettian complex of SW. Russia, with the latter's predominantly Western affinities forming a chain of relationships across the continent to the Atlantic, but always south of the Arctic province.

The full significance of these remarkable continua of interrelated industries will, no doubt, require further study before we can fully understand their implications, but at least we can hardly offer an explanation in terms of simplistic functional determinism without some recourse at least to more complex factors of a sociological nature.

Finally, before we turn to the cognate problem raised by the rapidly accruing data on contemporary communities in the Asiatic sector of the U.S.S.R., it may be opportune to glance briefly at some of the problems of periods earlier than the Upper Palaeolithic.

We have seen something of recent advances in knowledge in connection with the heated dwellings of the South Russian Gravettian as an adaptation to their largely woodless and stoneless environment. It is interesting to learn that some workers now believe that similar traces can now be detected in the settlements of the far north just referred to.[1] Furthermore we have seen that we now have proof of the presence there of Mousterian groups of a certainly earlier period, presumably equipped with a more primitive technology yet adequate for the very same area. It seems almost inconceivable that this should have been achieved without comparable dwellings and indeed effective clothing (since the distances are far too great for seasonal migration to play more than a minor role).

Direct evidence of heated huts constructed in the wind-swept

[1] Vereshchagin, N. K. (1971) and (1974).

steppe is now forthcoming for the Mousterian also. At the site of Molodova I in the Ukraine (a short distance from the multi-level site referred to earlier) a bone scatter assumes the same circular plan (implying a superstructure of hide weighted down with

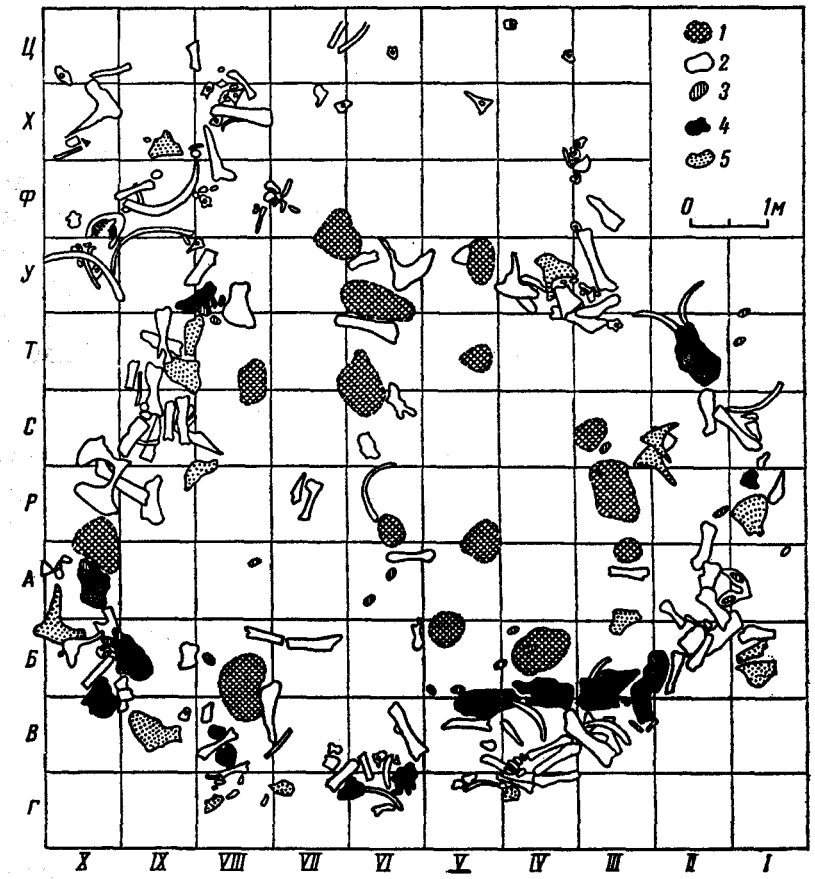


FIG. 3. Ground plan of bone scatter at Molodova. 1. Hearths. 2. Mammoth limb bones. 3. Mammoth molars. 4. Mammoth skulls. 5. Mammoth scapulae. Note position of skulls and limb bones forming a circle within which the hearths occur and also delimiting a very large concentration of stone artifacts. The whole is interpreted as evidence of a heated hut of simpler construction than those of the Gravettian but essentially comparable in function. (After Chernysh (1969).)

heavy bones) enclosing a dense concentration of living debris (Fig. 3). Although the arrangement of the hearths is noticeably different from those of the later period—they are much smaller, more numerous, and scattered about in a random fashion—the whole structure implies an equally effective shelter against the bitter winds of Ice Age Russia, or indeed those of Interglacial

winters if the present-day regime is any indication.[1] This is the first indication of its kind and positively dated to 44,000 b.p., so it can hardly be a terminal manifestation or due in any way to incoming cultural practices associated with the Upper Palaeolithic.

Finally, we may touch on the interesting problem raised by the rarity of traces of still earlier periods of human occupation. It will be recalled how immensely abundant are traces of such occupations (mainly Acheulian) along the Atlantic coasts of SW. Europe, and the Levantine coast of the SE. Mediterranean. In Central Europe such sites thin out rapidly, and we can now see a closely similar pattern in Russia. Thus, although undoubted traces of this epoch are now available from Armenia, Georgia, and other regions south of the Caucasus, and to a small extent are recognizable on the northern slopes of the Caucasus as well, despite half a century and more of intensive research the most that has come to light any distance further into Russia are one or two isolated and undated, supposed hand-axes of dubious identification and a few coarse accompanying flakes.

Two geological features may help to explain this absence during periods of glacial maxima. The Dnepr or Penultimate Glaciation is known to have extended very much farther across the South Russian plain than its successor during the Valdai: indeed the difference between the two is now seen to have been very much greater (as I have noted above) than used to be supposed. A more recent discovery is the size and width of the ancient channel known as the Manych Straits which drained the Caspian—immensely swollen by the outflow from the ice-sheet —into the Sea of Azov. This would certainly interpose an impassible barrier between the Caucasus and Russia in Glacial times, but is hardly relevant to the situation in Interglacials. Clearly, there is still much to be investigated on this issue, but one observation that does not seem to have been considered previously may perhaps be worth drawing attention to. It is interesting to see that under present-day (interglacial) conditions both in the western sector of Germany and south-eastwards across Central Europe the zero isotherm for January corresponds remarkably closely to the zone at which all traces of the Lower Palaeolithic peter out. Exactly the same can now be seen to occur in Southern Russia where the zero January isotherm includes the northern shore of the Black Sea and passes

[1] See for instance the climatic data noted by Klein R. G. (1973) from various Russian sources.

immediately north of the Caucasus. Further north still the January isotherm grades rapidly down to −10 °C., comparable with, say, southern Canada. Over the greater part of the main Acheulian distribution in Western Europe and SW. Asia only the most rudimentary shelters, if indeed any at all, would be required, and clothes would certainly not be a necessity judging by recent studies, say, of the Australian aborigines and their physiological heat requirements. Dispensing with either of these purely cultural adjustments even in the interglacial winter of Southern Russia is, however, another matter, given the characteristically wide seasonal variation. Nor would the distance involved permit adequate compensatory seasonal migrations.

Thus, unlike the Middle Palaeolithic—where we have seen that there is positive indication of heated huts and indirect indications of clothes—during the Lower Palaeolithic it seems possible that climate may well have been the controlling factor which limited human expansion to the north, especially under marked continental conditions such as must have at all times prevailed in Eastern Europe.

Similar indications of distribution have recently been documented by V. A. Ranov[1] east of the Caspian and in the regions immediately north of the Hindu Kush. Here and in the southernmost part of the Soviet are some possible traces of occupation prior to the Upper Pleistocene, in the form of assemblages of pebble tools in eroded alluvial terraces and fans,[2] also one or two possible hand-axes. These are all clustered in and round the +10° isotherm, beyond which remains of any kind are of extreme rarity. It is interesting, on the other hand, how the now fairly numerous finds of Mousterian character have been identified throughout wide areas of Kazakhstan, that is to say, well north of the −10° line.[3]

In this last connection, however, another problem confronts us, for these Middle Palaeolithic traces in their turn peter out unmistakably to the north-east, with the furthest certain occurrence so far in the Altai foothills, the well-known site of Ust Kanskaya[4] and some more recently reported finds at Sagli (on

[1] Ranov, V. A. (1971).

[2] To the sites named by Ranov I can now add one more obtained during my expedition to the Kopet Dagh in 1971 (McBurney, C. B. M., 1972) near Sarakhs.

[3] Medoev, A. G. (1970) illustrates bifaces which may, however, be part of Mousterian of Acheulian tradition.

[4] The results of my first-hand examination of the collections from Ust Kanskaya, kindly made available by N. K. Anisiutkin. I personally was left

the border between the Tuva A.S.S.R. and Mongolia south of the Sayans).[1]

Beyond this in Central and Eastern Siberia there are few, if any, unambiguous traces of Mousterian. Y. Mochanov has recently illustrated a roughly discoid core from Ezhantsi, a site on the Aldan about 61° 30 N. 135° 00 E.[2] which he includes as part of his earliest Upper Palaeolithic, at shortly before 35,000 b.p. Okladnikov and others have referred to possible traces of 'Levalloisian blades' [*sic*] and surface undated Middle Palaeolithic scatters of the Upper Amur. As to the former I must frankly say that I cannot agree with the diagnosis as far as the illustrated pieces are concerned. It could easily occur in any rough blade assemblage. All in all, the absence of significant traces of the Middle Palaeolithic east of 100° longitude and still more clearly north of 55° is remarkable by comparison with the relatively numerous and well-characterized finds in Kazakhstan and westwards. If future research should confirm these distributional limits what possible explanation can we propose? The problem is of some moment from several points of view, above all in connection with the possibility of early settlement in the New World. There a similar absence has long been noticed, as also in Japan and generally in the far north-east of Siberia east of the Verkhoyansk range. It is perhaps most conveniently to be considered in the light of new environmental evidence to be discussed in a moment.

The final section of my paper is concerned with a brief summary of the status of the Upper Palaeolithic in the immense triangle of Soviet territory east of the Urals, in the light of the most recent comments and discoveries of Soviet prehistorians. Although parts of this area are still virtually unexplored, others have been subjected to intensive and extremely fruitful research.

Siberia as a whole is by no means the *terra incognita* it was until a few years ago despite the fact that it was the scene of the earliest Palaeolithic researches in the Russian Empire (as it was then) in the second half of the nineteenth century.

Since the Revolution and especially the last war, substantial work has been carried out in Central Siberia in cis-Baikalia, and more recently in the middle Yenisei basin to the west, and

in no doubt of the typical Levallois-Mousterian character of the culture, despite the doubts expressed by some foreign authors.

[1] Beregovaya, N. A. (1972). See also Medoev (1970).

[2] Mochanov, Y. A. (1975), Fig. 3, p. 13. The precise date is *over* 35,000 ±600 (loc. cit., folding table opposite p. 26).

(following pioneering work by A. P. Okladnikov) extensive researches are in progress on the Middle Lena and Aldan, far to the north along the shores of the Arctic Ocean, in Kamchatka, south-eastwards in the Amur Basin linking with the latest results in Japan, and finally to the west and south-west in Kazakhstan and the Oxus Basin linking with current work in Afghanistan. In the present paper there will be the opportunity only to touch on some of the salient features of these researches in order simply to complete our general picture of human expansion during the Pleistocene.

The essential background here, as always in like problems, is provided by palaeoclimatic and environmental research, whose foundations have now been firmly laid by E. I. Ravsky, S. M. Tseitlin, N. V. Kind, and a number of others and made available to non-Russian speaking Anglo-Saxons by R. G. Klein. From this we can see that the Last Glaciation (the Valdai of more westerly regions) corresponds in Siberia to a tripartite event—the Zyrianka Stadial, followed by the milder Karginski interstadial complex, followed in turn by the intensely cold and dry Sartan Stadial. It is worth noting the similarity to the North American sequence, and also to a slightly less extent the South European sequence, and that of the deep-sea sedimentary cores, although the patterning is somewhat less clearly marked close to the Scandinavian ice sheet in the Netherlands.[1] The whole picture is now knit together by radio-carbon readings, and time calibration of the corresponding movements of sea-level (and hence emergence of the land-bridge across the Behring Straits) has also been recently obtained. This last shows for instance a viable link with America for a duration of some 20,000 years during the Zyrianka and again during the Sartan, say from 28,000 to 9,000 b.p. approximately.

To begin with Central Siberia, two areas in this region are of prime importance. The first lies immediately west of Lake Baikal in the Angara Basin and the second, the subject of particularly active current research, on the Yenisei (Map III). In both we have a geological succession based on a terrace sequence time-calibrated with multiple C14 readings. Both dates and geology indicate a 10,000-year span at least (from or before 20,000 b.p. to around 11,000) for a remarkably stable cultural tradition.

[1] The most recent record, however, and the most complete of its kind so far available from Europe, the Aghia Phillipon pollen sequence from the Aegean, shows once again the same basic tripartite patterning. See van der Hammen, (1971).

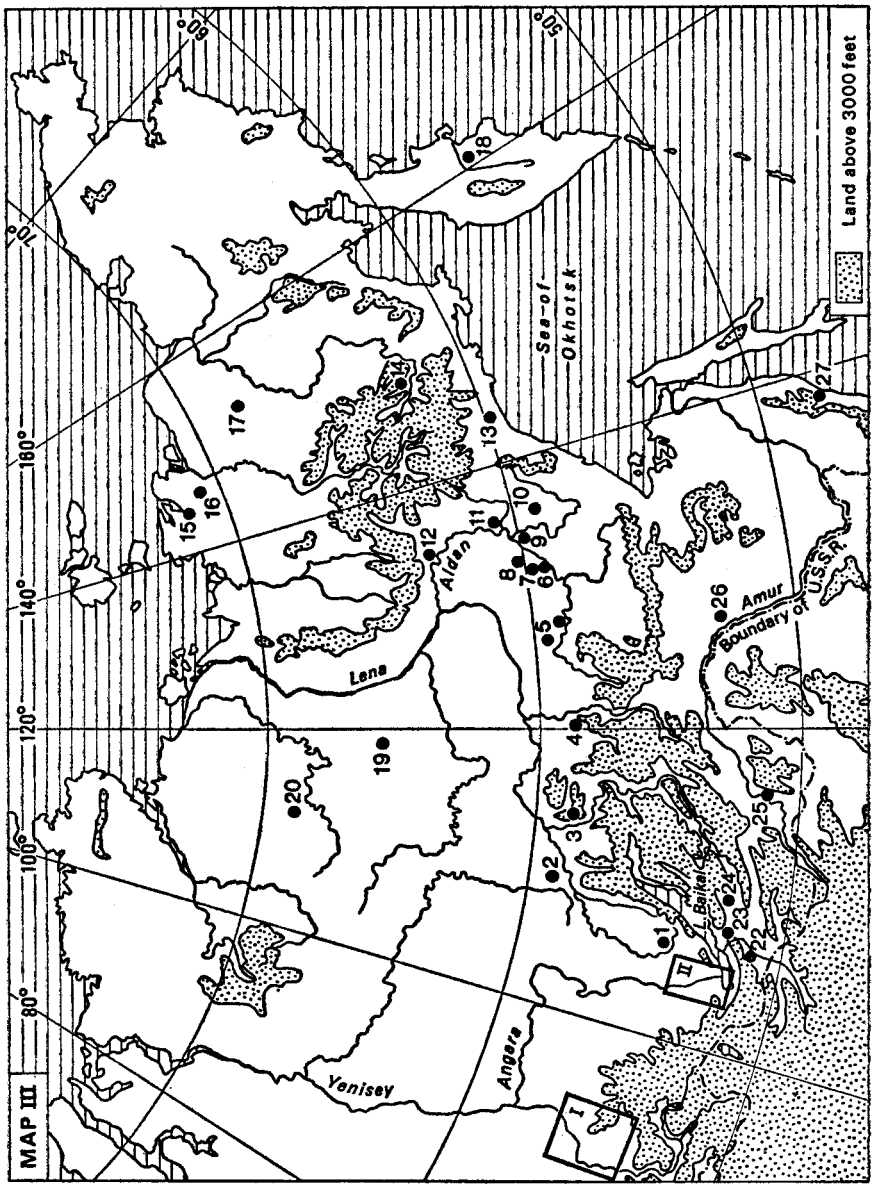
Some degree of cultural variation is, of course, to be observed both regionally and chronologically but probably of less moment than used to be supposed.

The most distinctive of these two regional groups is represented at the well-known site of Maltá on the Bielaya (a tributary of the Angara) and at Buret. Here the lithic industry lacks some of the features which usually characterize the Siberian Upper Palaeolithic (notably the highly distinctive 'wedge-shaped' cores for the production of micro-blades, and the bifacial elements especially characteristic of regions further to the east) but does include the coarse flake implements which are such a widespread feature. This lithic component is associated with a sophisticated bone and ivory industry with many elements in common with other Siberian sites, and finally the well-known female figurines. These last have often been compared to those of the Gravettian in the West but after examining the originals I agree with P. Boriskovsky that 'they are done in quite another manner than those in Europe'.[1] The treatment of the faces is characteristic and wholly different from those on 'Venus' figurines in the Gravettian (I do not include for this purpose certain isolated heads whose connection with the 'Venus' motif has never been demonstrated), and so also is the hair-style and the presence of clothes on a number of examples. As Okladnikov remarks, the fact that others are naked is little evidence of a connection with the West owing to the simple necessity for Arctic peoples to strip whenever they entered heated huts in winter. Nor does this rather aberrant variant of the Siberian Upper Palaeolithic turn out to be, as used to be supposed, the earliest variant (Sosnovsky, quoted by Boriskovsky)—the two available dates are $14{,}750 \pm 100$ GIN 97 and $23{,}000 \pm 500$, much later as we shall see than a substantial number of other Siberian sites.

In general the bulk of Siberian Upper Palaeolithic sites share a number of distinctive features which contrast in a specific way with both the Gravettian and Sunghir variants of the Upper Palaeolithic on the Russian Plain.[2] Thus backed-blades which form such a regular feature of the Russian Gravettian are virtually absent, or at most extremely rare and atypical, in Siberia. In their place we have an advanced and characteristic technique

[1] Boriskovsky, P. I. (1970).

[2] Boriskovsky remarks, 'Yet all the Siberian sites reveal common features, different both from all the sites of the Russian plain and all the sites in the Caucasus and Crimea. Upper Palaeolithic Siberia forms a big integral local group.'



MAP III

1. Makarevo
2. Chastinskaya
3. Audeikha
4. Novy Leten
5. Sumnagin
6. Dyuktai
7. Ust Bilir
8. Ust Mili
9. Troitskaya
10. Kyra Krestyakh
11. Ezhantsi
12. Ikhine
13. Kukhtui
14. Maidrich
15. Berelekh
16. Chokurdakh
17. Bochanut
18. Ushki
19. Kiuskiunde
20. Olenek
21. Bel'kach
22. Povoaet
23. Oshurkovo
24. Sannyi Mys
25. Ikarali
26. Filimoshki
27. Ustinovka

I. *Yenisei Group*

Buzunova
Tashtyk
Lepeshkino
Aeshka
Kokor'evo
Novoselovo
Biryusa
Afontova Gora
Krasnoyarsk
Keroviy Log
Kacha
Achinsk
Druzhinika

II. *Angara Group*

Kaiskaya Gora
Irkutsk
Verholenskaya Gora
Maltá
Cheremushnik
Badai
Ust Bielaya
Buret
Lenkovka
Fedyaevo
Krasnyi Yar

for the manufacture of microlithic (untrimmed) blades formed with great precision purely by primary technique and core-form. Such blades were regularly inserted in composite bone points provided with V-shaped slots for the purpose. Numerous microlithic end-scrapers of minute proportions are another feature.[1] Finally, we have characteristically combined with this small-scale precision element another, as I have said, of macrolithic proportions. This often included bifacial tools of various shapes from large leaf-forms to ovates, also several categories of pebble tools sometimes of massive proportions and deceptively archaic appearance, such that they would not have been out of place in the Middle Pleistocene at Chou-kou-tien.

One of the more recently investigated groups of this character is on the Middle Yenisei and typified by the sites at Kokor'evo (Plates XIII and XIV and Fig. 4). Here the lithic element is particularly well displayed with the possible exception of the leaf-shaped bifacial points. The accompanying bone and antler objects are especially interesting with a range of slotted points (one at least with its micro-blades in place (Plate XIV)) and pierced batons.[2] C14 dates range from 18,330±100 GIN 90 to 12,690±140 b.p. An idea of the variation within this group is given by the long-known site of Afontova Gora recently dated to 20,900±300 GIN 117.[3]

	Afontova Gora	*Kokor'evo*
Large flake side-scrapers	Present	Present
Large burins	Abundant	Rare and poor
Slotted bone points	With narrow cross-section	With wide cross-section
Backed blades	Absent	A few
Large 'Aurignacian-type' trimmed blades	Absent	Present
Leaf-shaped point	Present	Atypical bifaces only
Wedge-shaped cores	Present	Present

North and east of Baikal is a third area where current work is producing fundamentally new results. A. P. Okladnikov made the pioneering discoveries here on the Upper Lena—some thirty separate Upper Palaeolithic sites, including the possibly

[1] Bader, O. N. (1965). [2] Abramova, Z. A. (1971).

[3] Comparative data, kindly supplemented by A. N. Astakhov in a personal communication.

Palaeolithic decorated site of Shishkino, with drawings of horses and wild ox in red ochre. The most recent development is the discovery and exploration of a series of sites on the Aldan, a major right-bank tributary of the middle Lena.[1] These, discovered and studied by Y. Mochanov and other workers of the

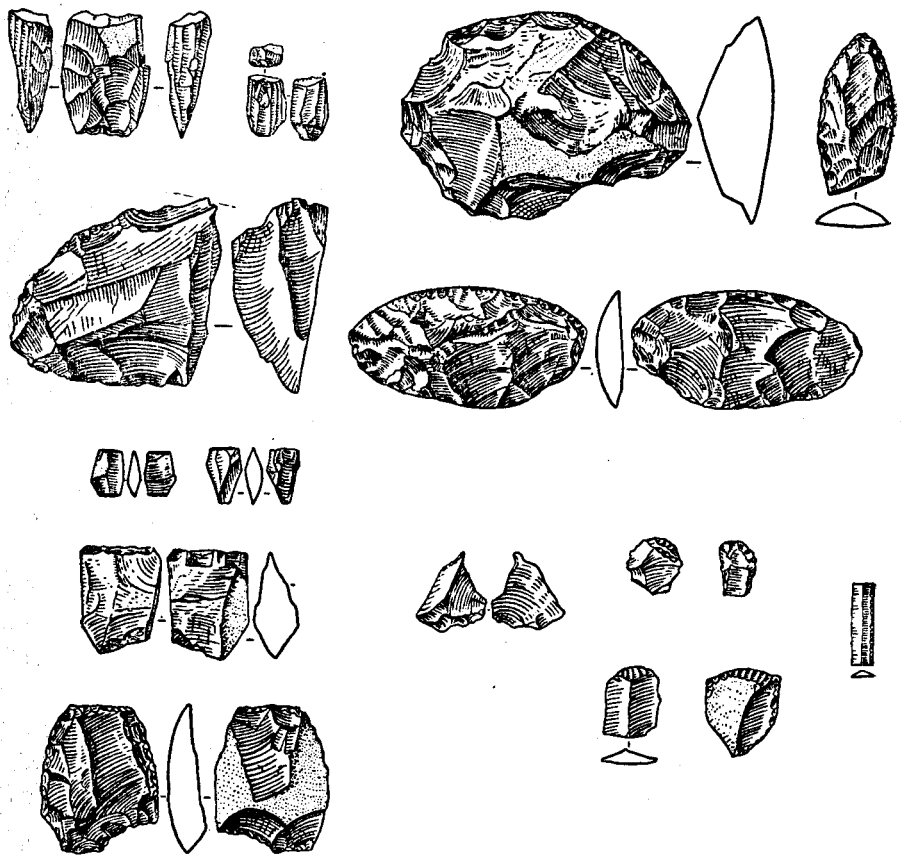


FIG. 4. *Kokor'evo II* (Yenisei Basin, Siberia). Selection of implements, dated 13,330 b.p. Note top row left, two micro-blade cores. Top row right, macrolithic side-scrapers and bifacial tool. Bottom row right, microlithic end-scrapers and retrenched blade. (All after Z. A. Abramova (1971).)

Archaeological Institute of the University of Yakutsk, offer a substantial series of multi-level sites dated by a wealth of C14 readings. A full account of the lithic typology has yet to reach the writer but it is already clear that the main features of the new Siberian complex—termed by Mochanov 'Dyuktai Complex'—are present at or shortly before 31,200±500 b.p. (GIN 1020) and probably as early as 35,400±600 b.p. Here, as on the

[1] Mochanov, Y. A. (1975).

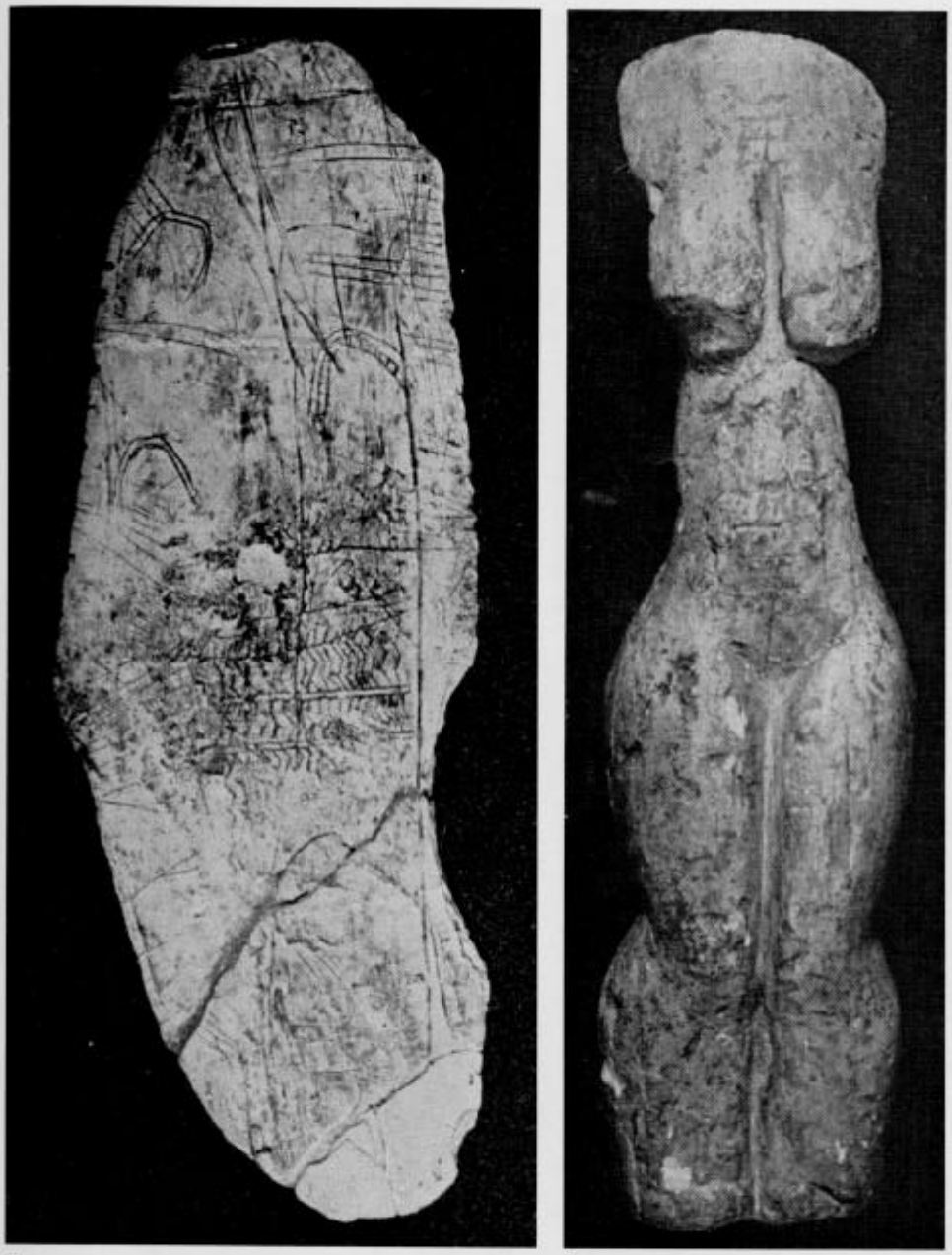
Angara and the Yenisei,[1] the dates are supported geologically by a well-defined terrace sequence. The oldest series comes from horizontally bedded alluvial deposits of the third or Upper Terrace at 16 to 18 m. The earliest horizon occurs in the site of Ezhantsy in the lower deposits of this terrace. Four readings in the Upper portion range from 23,500±500 LE999 to GIN 1020 just quoted, while three in the lower half read 30,000±500 LE1001 to 33,000±500 LE1000 (in addition to LE954) (Fig. 5). The earliest occupation traces at this site are of an open-air station yielding large numbers of diabase cores, some of them reminiscent of pebble tools, and small cores of flint of the typical 'wedge-shaped' form for the production of micro-blades (Fig. 6).[2] In addition there was a broken bifacial knife typical of most of the sites in this region and a discoid core of vaguely Mousterioid appearance. Three other sites occur in the same formation with the same lithic content in multiple layers and with stratigraphically consistent dates within reasonable limits.

These are the earliest traces of man so far discovered in NE. Siberia, and the remarkably uniform lithic equipment continued in use with little change right down to the end of the glaciation (dated by multiple C14 readings to about 11,000 b.p.). The game hunted continued to include mammoth, woolly rhinoceros, and bison as the dominant species throughout this succession.[3] Further finds have been made along the shores of the Arctic Ocean east of the Taimyr Peninsula in one of the classic areas for discovery of frozen remains of mammoth. Here in 1961 reindeer hunters discovered a mammoth tusk with a skilful, partly stylized, partly naturalistic, engraving of a mammoth (Plate XVI(a)) near a locality on the river Berelekh, not far from the mouth of the Indigirka. Subsequently a closed prehistoric occupation was found here which yielded the same lithic

[1] For a clear account of the latter see Klein, R. G. (1971).

[2] It is significant that similar cores are found throughout the duration of the Dyuktai Complex and Mochanov suggests that they may in some cases be roughouts for the wedge-shaped type.

[3] A faunal change to recent species (in which mammoth, woolly rhinoceros, musk ox, horse, and bison give way to elk, reindeer, red deer, roe deer, and brown bear) is associated with the appearance of a new lithic tradition termed by Mochanov the 'Sumnagin Complex'. This is characterized among other details by the disappearance of the bifacial element so typical of the Dyuktai and the substitution (a little later) of the so-called 'pencil core' (apparently the same as Dupree's 'bullet core' in Afghanistan) for the earlier wedge-shaped core. Functionally the latter appears to be a more effective process for producing micro-blades.



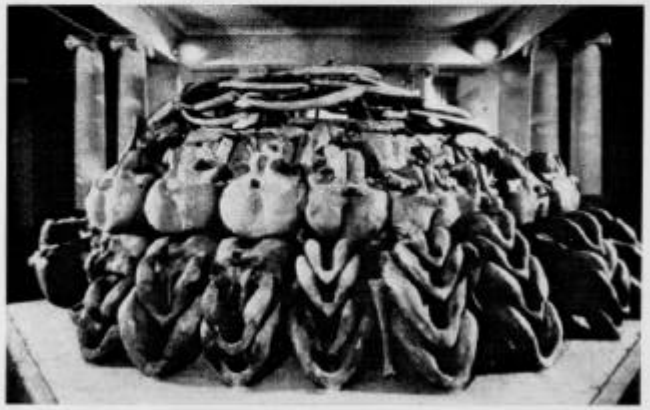
a *b*

Eliseevici: (*a*) One of several plates of mammoth ivory with engraved geometric patterns. Note parallel chevrons and possible hut symbols. (*b*) 'Venus' figurine of unusual proportions. Both pieces are said to be associated with a C14 date of 33,000 b.p.

Photos: Akademia Nauk

a

b

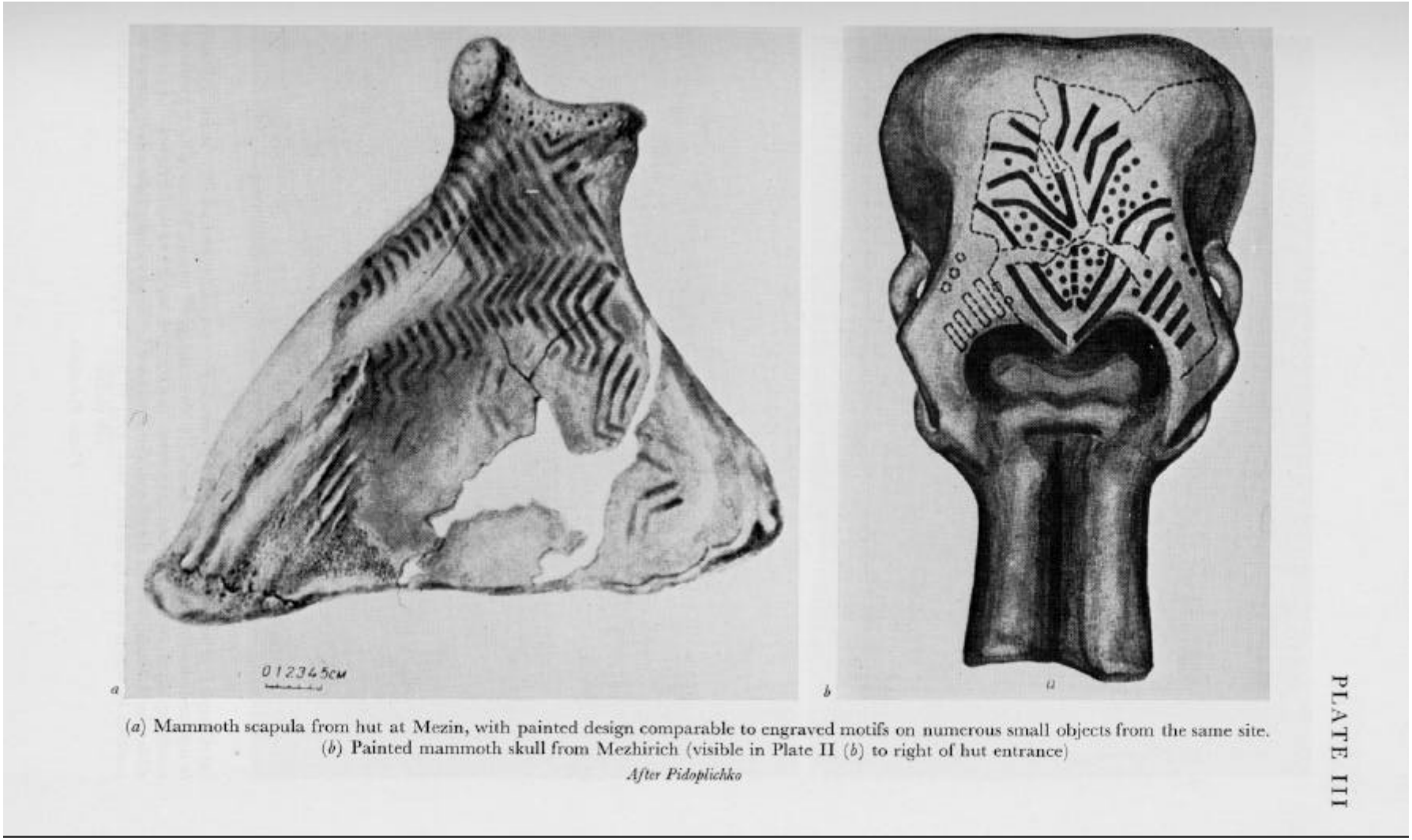


c

d

(*a*) Excavation in progress on a circular hut at Mezhirich (Ukraine), constructed of mammoth bones. Note ring of interlocking mandibles, and position of tusks, thought to be representative of the collapsed traces of an entrance. (*b*) Side-view of reconstruction after removal to Kiev Museum. (*c*) Rear view of hut. (*d*) Front view

Photos: Pidoplichko



(*a*) Mammoth scapula from hut at Mezin, with painted design comparable to engraved motifs on numerous small objects from the same site.
(*b*) Painted mammoth skull from Mezhirich (visible in Plate II (*b*) to right of hut entrance)

After Pidoplichko

PLATE III

PLATE IV

a

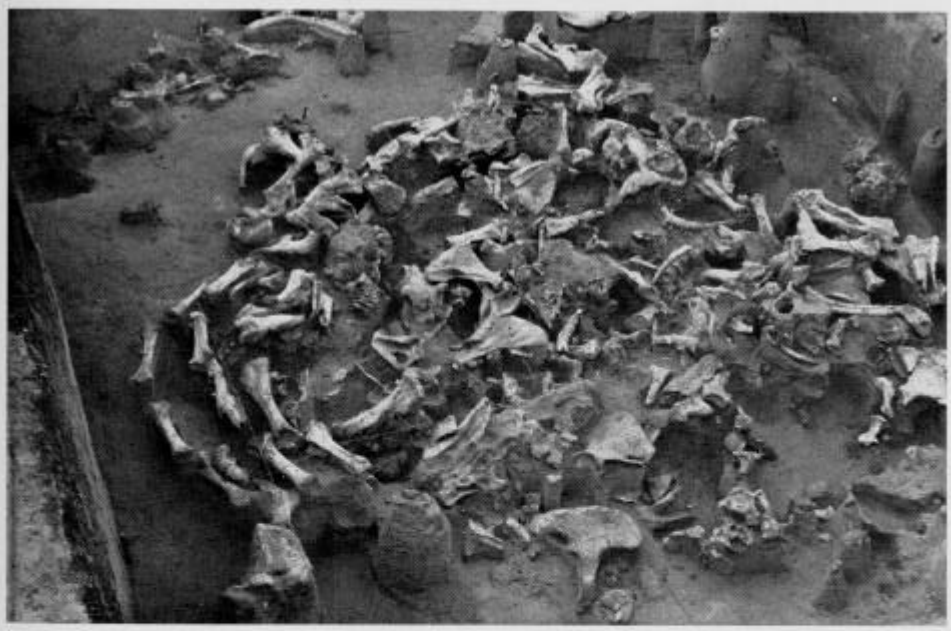
b

(*a*) Complex of hut and four pits with large exterior hearths at Dobranichevka; this design is repeated elsewhere on the same site. (*b*) Foundation of hut at Mezin after removal of overlying bones. Note difference in construction marked by use of skulls rather than mandibles, as at Mezhirich and elsewhere. The skulls are believed to have fallen from a vertical position in which the tusk sockets were used to hold supports for the roof. Three hearths are visible

Photos: Pidoplichko

PLATE V

a

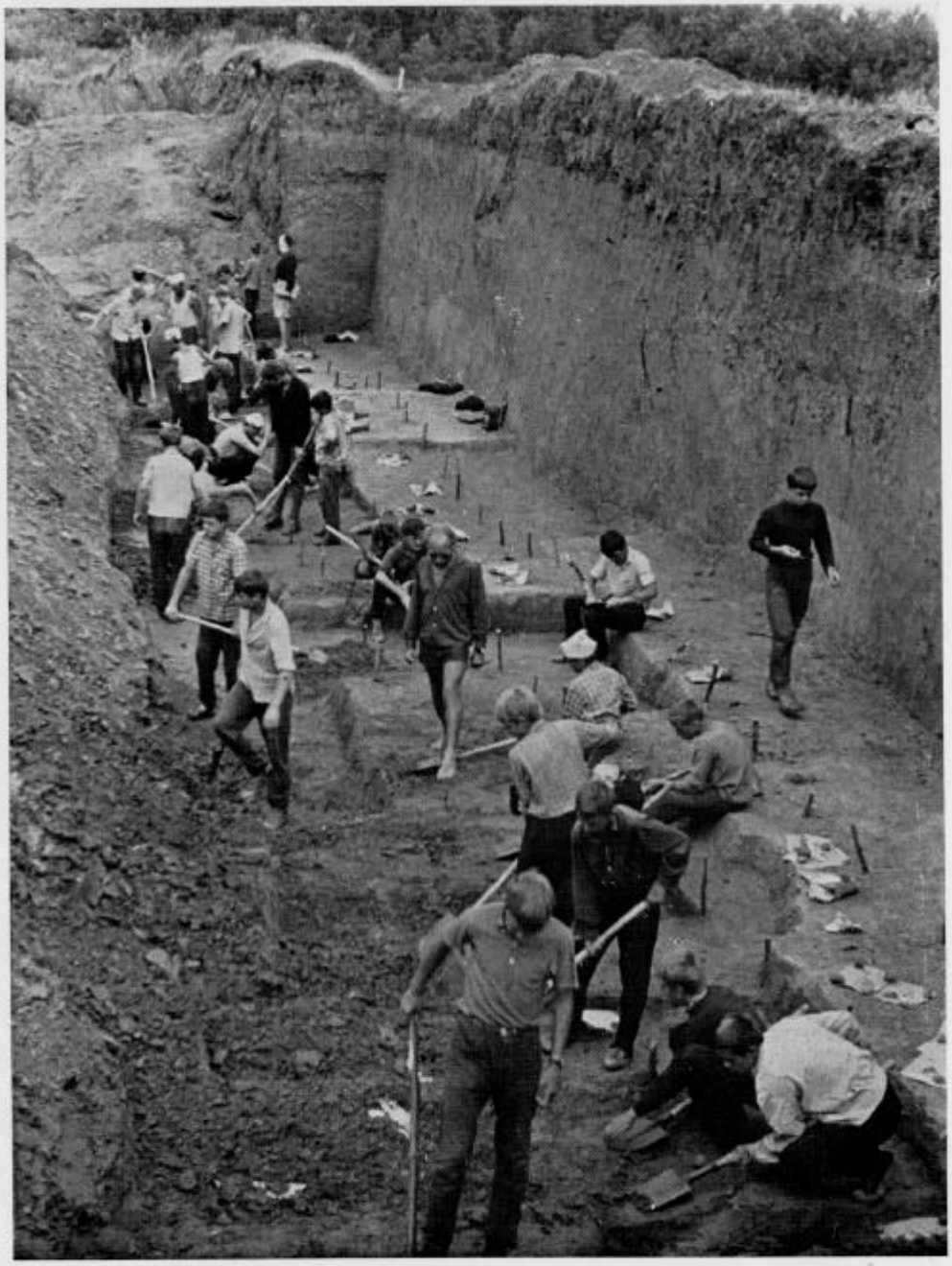


b

(*a*) General view of the village of Kostienki, showing the escarpment, dissected by steep-sided gullies, which define the interfluves or shoulders on which the ancient settlements were situated, overlooking probable game trails from the river to the plateau. (*b*) Structured bone heap showing traces of a disturbed hut of the Mezhirich type of construction

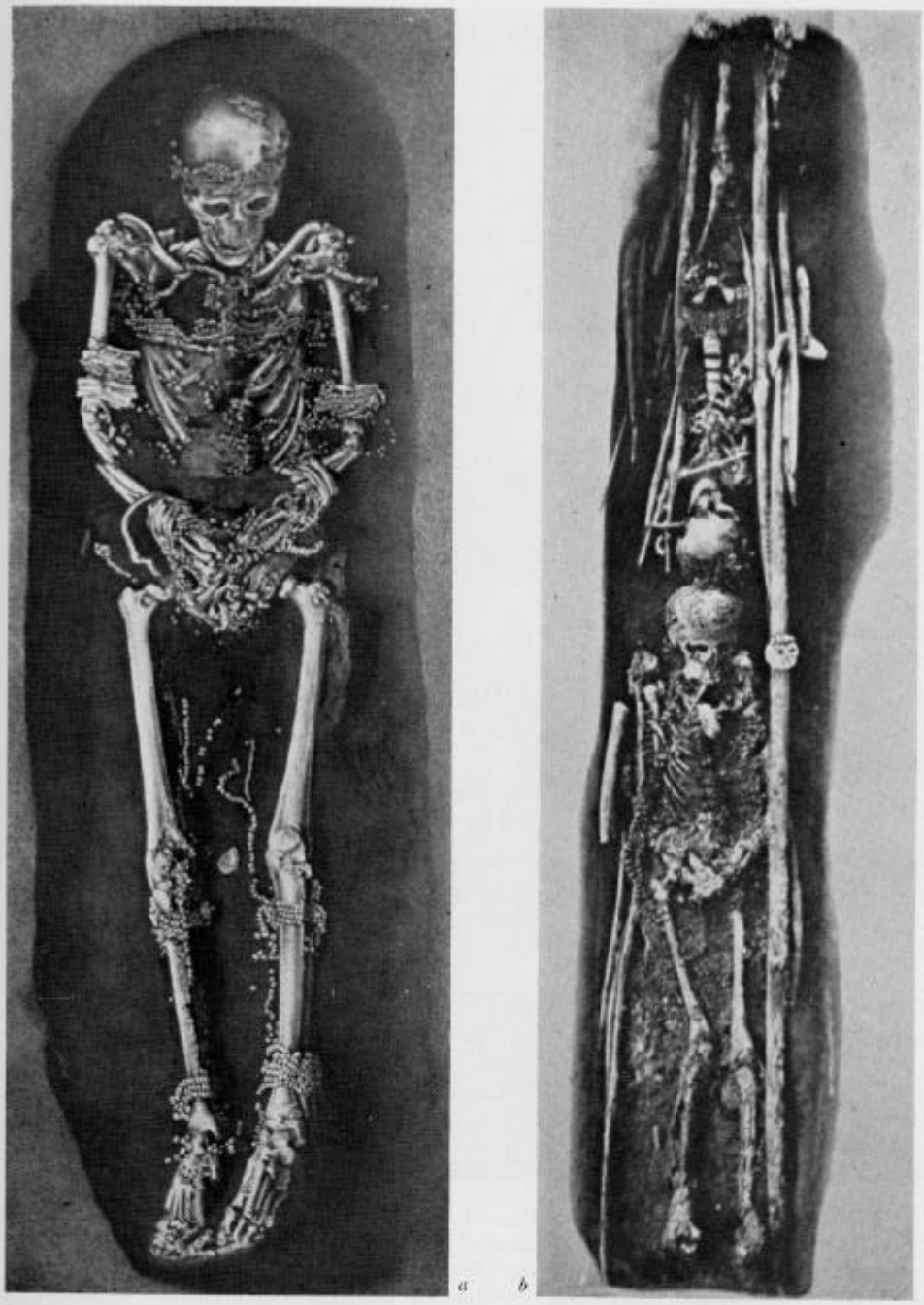
Photos: Rogachev

PLATE VI



General view of the excavations at Sunghir

Photo: O. N. Bader

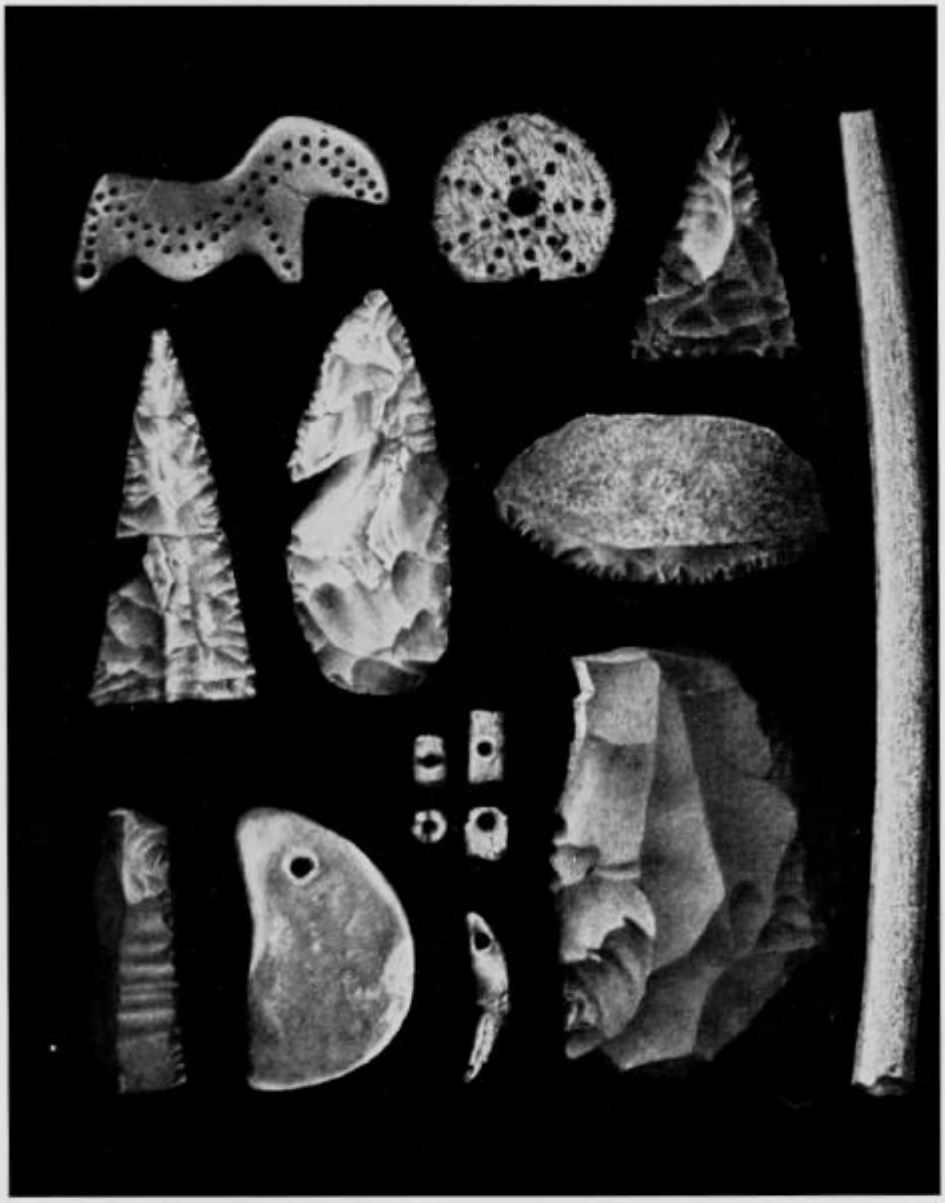


a *b*

The two best-preserved burials at Sunghir. Note the position of the beads and bracelets in the adult inhumation (*a*), and the spears, wands, and pierced disc and baton in the juvenile double burial (*b*)

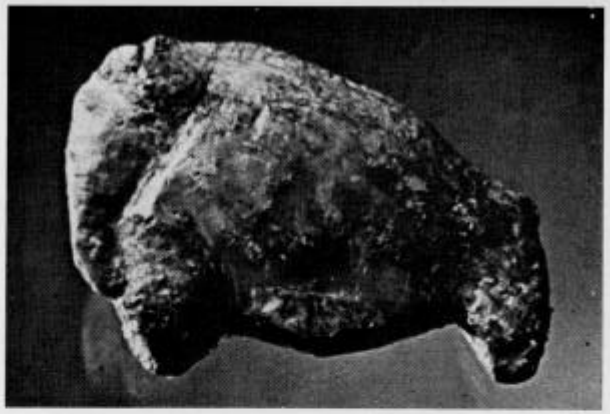
After O. N. Bader

PLATE VIII

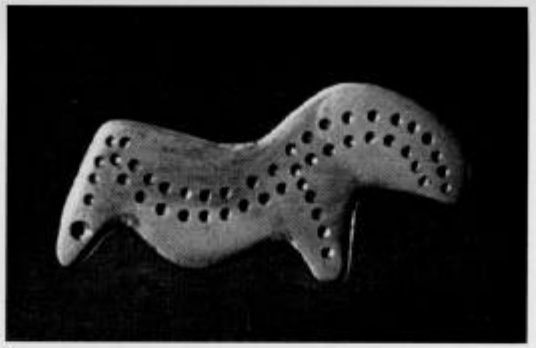


Small finds from Sunghir. Top row: horse and disc, both with drilled ornaments and bifacial missile head. Middle row: elongated bifacial point, leaf-shaped bifacial point and Mousteriform side-scrapers. Bottom row: flint blade, pierced pebble of imported stone, group of mammoth ivory beads, burin on Levallois-like flake and wand of bone

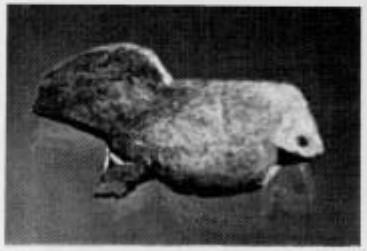
After O. N. Bader



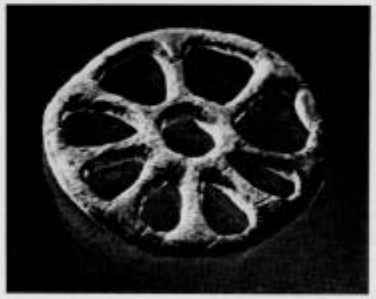
a



b



d



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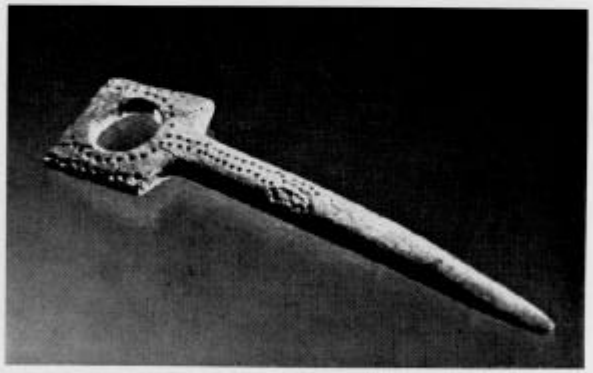


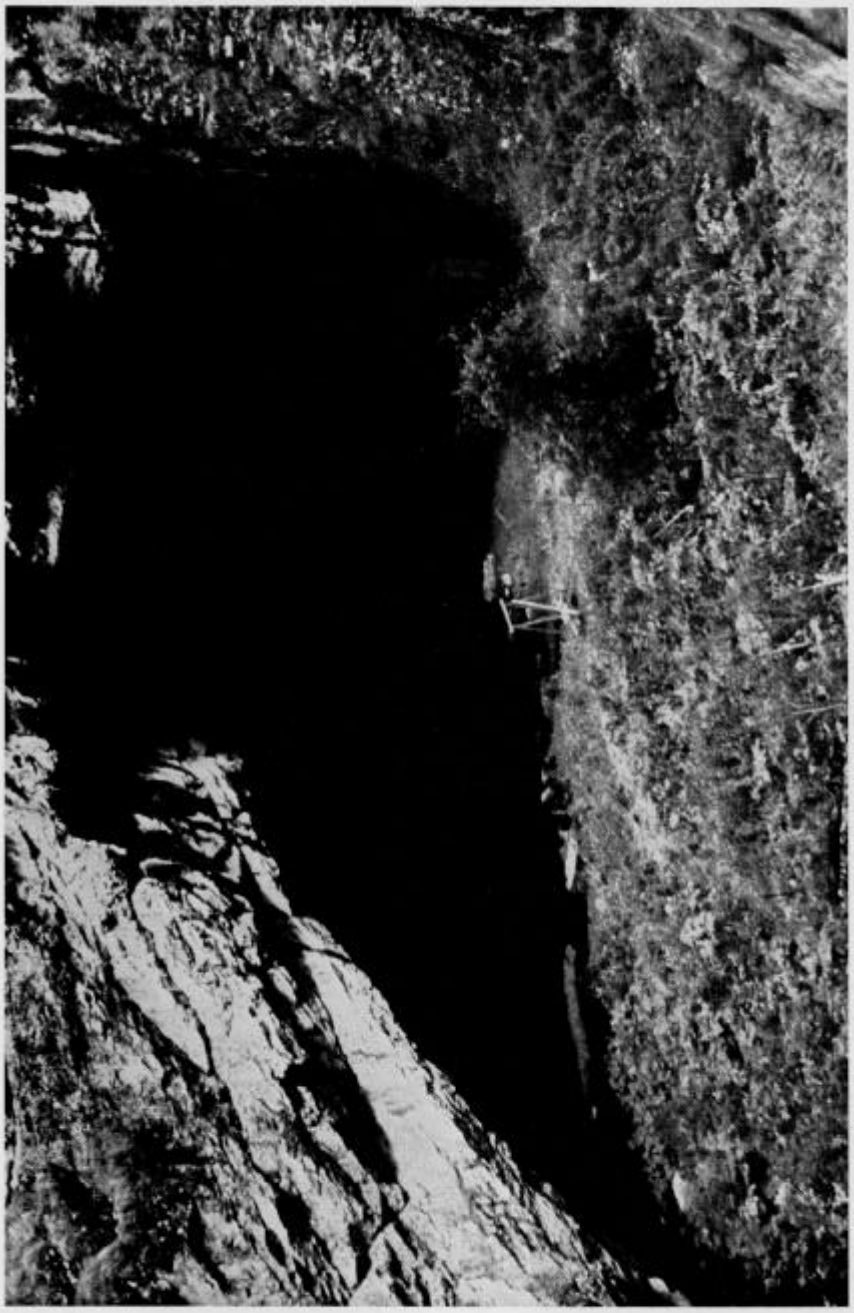
e

Sunghir. (*a*) Ivory carving of young mammoth; (*b*) detail of horse shown in Plate VIII; (*c*) baton of unusual form with drilled ornament; (*d*) carving of horse or antelope (?) pierced for attachment; (*e*) detail of open work disc seen in Plate VIII (*b*) resting on spear shaft

Photos: O. N. Bader

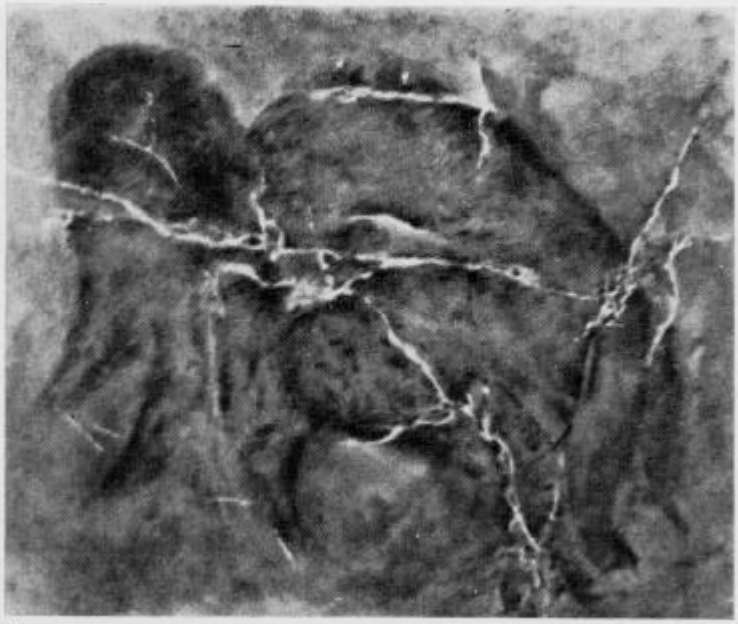
PLATE IX

PLATE X



Kapovaya. Entrance to decorated cave; scale given approximately by trestle, etc., in centre of opening

Photo: O. N. Bader



a

b

Kapovaya. Copies of two paintings of mammoth; note unusual treatment of forelegs and trunk

Photos: O. N. Bader

PLATE XII

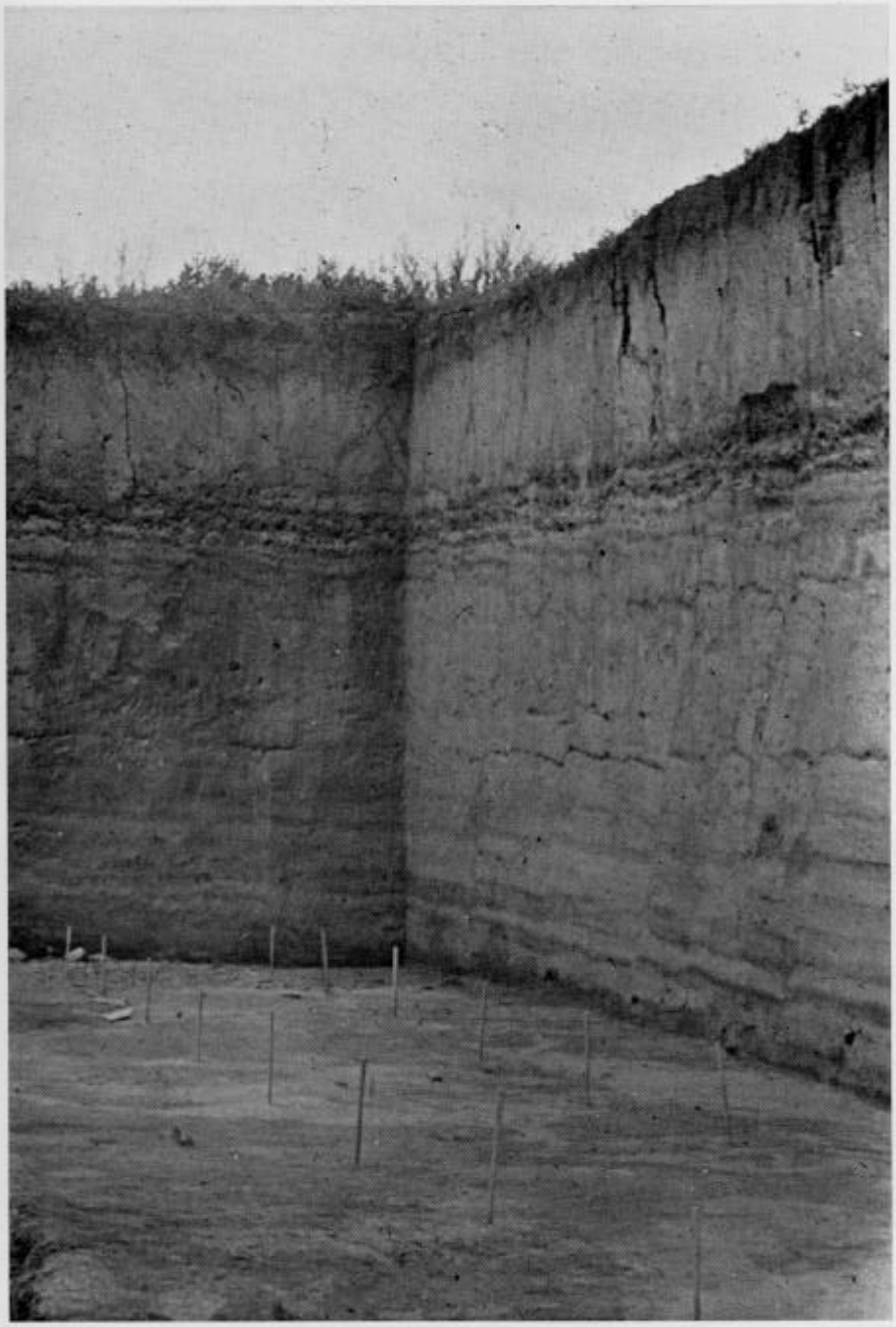
a

b

Kapovaya. (*a*) Direct photograph of three figures of mammoth facing to left. Note various stylistic details including treatment of trunk and tusks (?). (*b*) Direct photograph of bison (?) or rhinoceros

Photos: O. N. Bader

PLATE XIII



Kokor'evo (Central Siberia). View of small habitation site and working floor showing traces of probable Allerød age weathering

Photo: Abramova

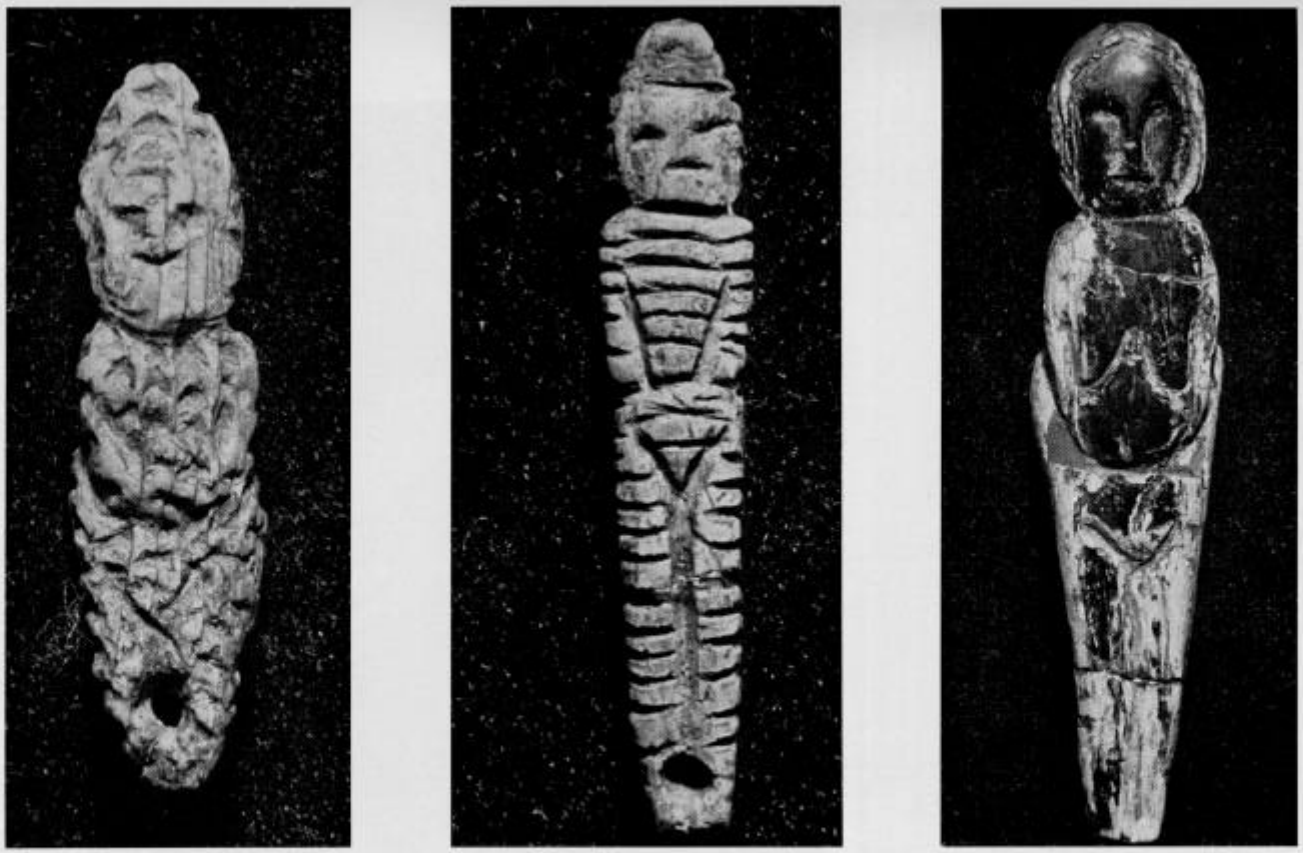
PLATE XIV

a

b

Kokor'evo. (*a*) Coarse pebble tools and flakes *in situ* in same site. (*b*) Fragment of slotted bone point with micro-blades in place

Photos: Abramova



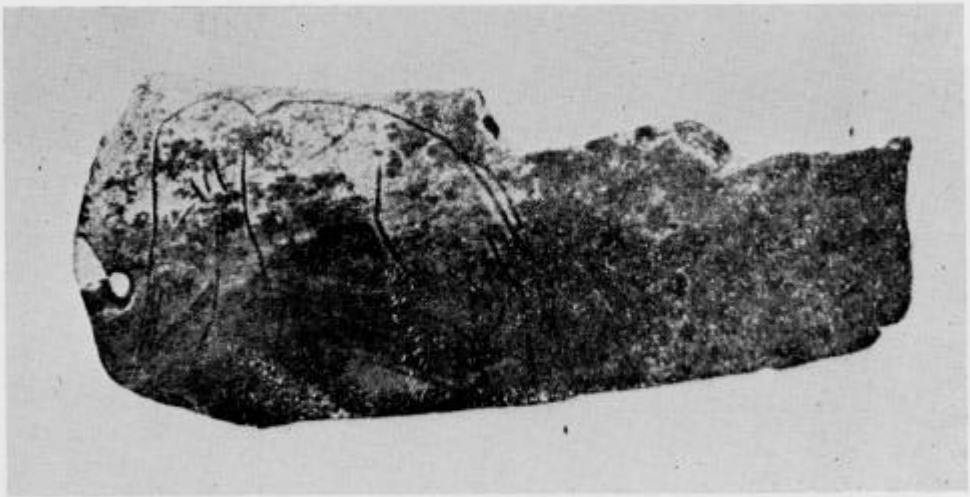
a *b* *c*

Detail of female figurines from Maltá (Siberia). Note various stylistic contrasts with Gravettian figurines, e.g., presence of facial details, clothes on (*a*) and (*b*), different hair-style, etc.

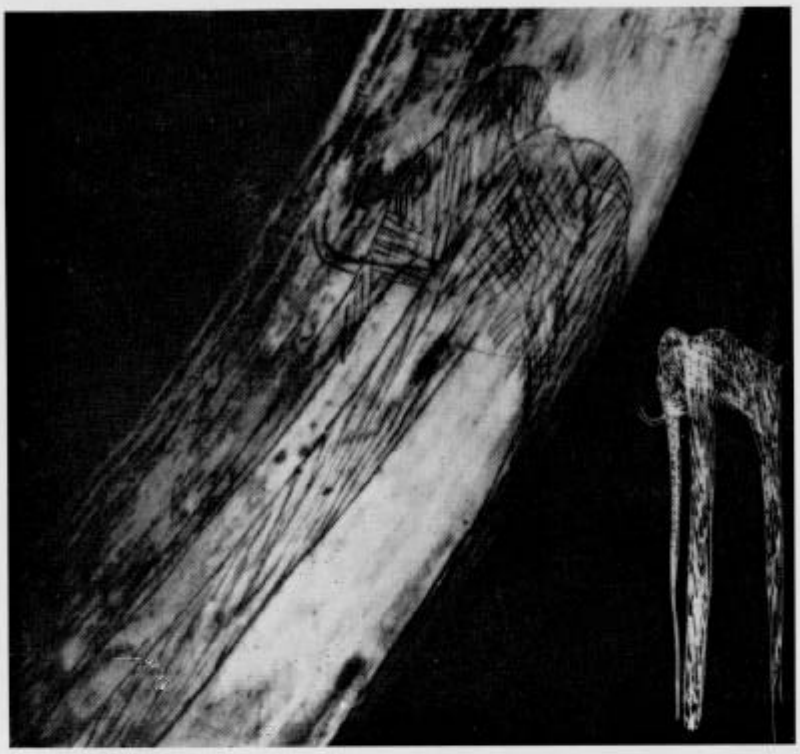
Photos: Akademia Nauk

PLATE XV

PLATE XVI



a



b

(*a*) Engraving of young mammoth on slab of ivory. Maltá (Siberia).
Photo: Gerasimov and Lenin Library, Moscow

(*b*) Engraving of mammoth on tusk from Berelekh (northern littoral of NE. Siberia), probably datable to same age as the settlement at 12,000–13,000 b.p. containing artifacts typical of the Dyuktai complex of Mochanov

Photo: Priroda and O. N. Bader

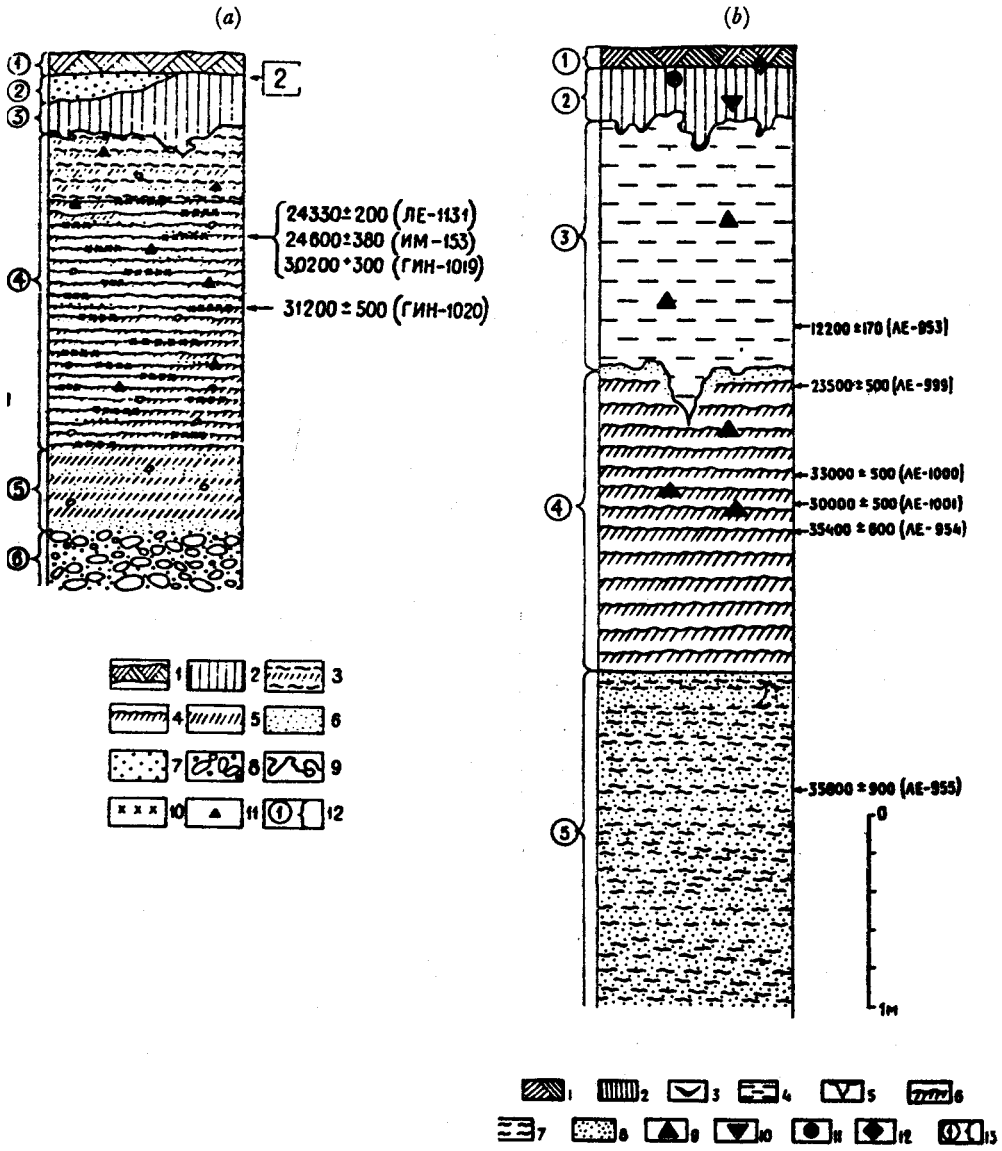


FIG. 5. Profiles containing Upper Palaeolithic from the Aldan Basin, NE. Siberia.

(*a*) *Ikhine II*: 1. Top soil. 2. Weathered brick-earth. 3. Cryoturbated brick-earth. 4. Horizontally bedded brick-earth. 5. Weathering horizons in brick-earth. 6. Sands. 7. Coarse sands. 8. Pebbly gravel. 9. Soliflucted interface. 10–11. Upper Pleistocene artifacts. 12. Reference numbers and boundaries of layers.

(*b*) *Ust Mili II*: 1. Top soil. 2. Cryoturbated brick-earth. 3. Weathered brick-earth. 4. Horizontally bedded brick-earth. 5. Ice-wedge disturbances. 6. Horizontally bedded brick-earth. 7. Brick-earth. 8. Sands. 9. Pleistocene artifacts. 10. Early Holocene artifacts. 11. Neolithic artifacts.

Note that the earliest artifacts at Ikhine considerably antedate the 31,200 reading and at Ust Mili II fall between 30,000 and 35,400. (After Y. A. Mochanov (1975).)

5137 C 76 P

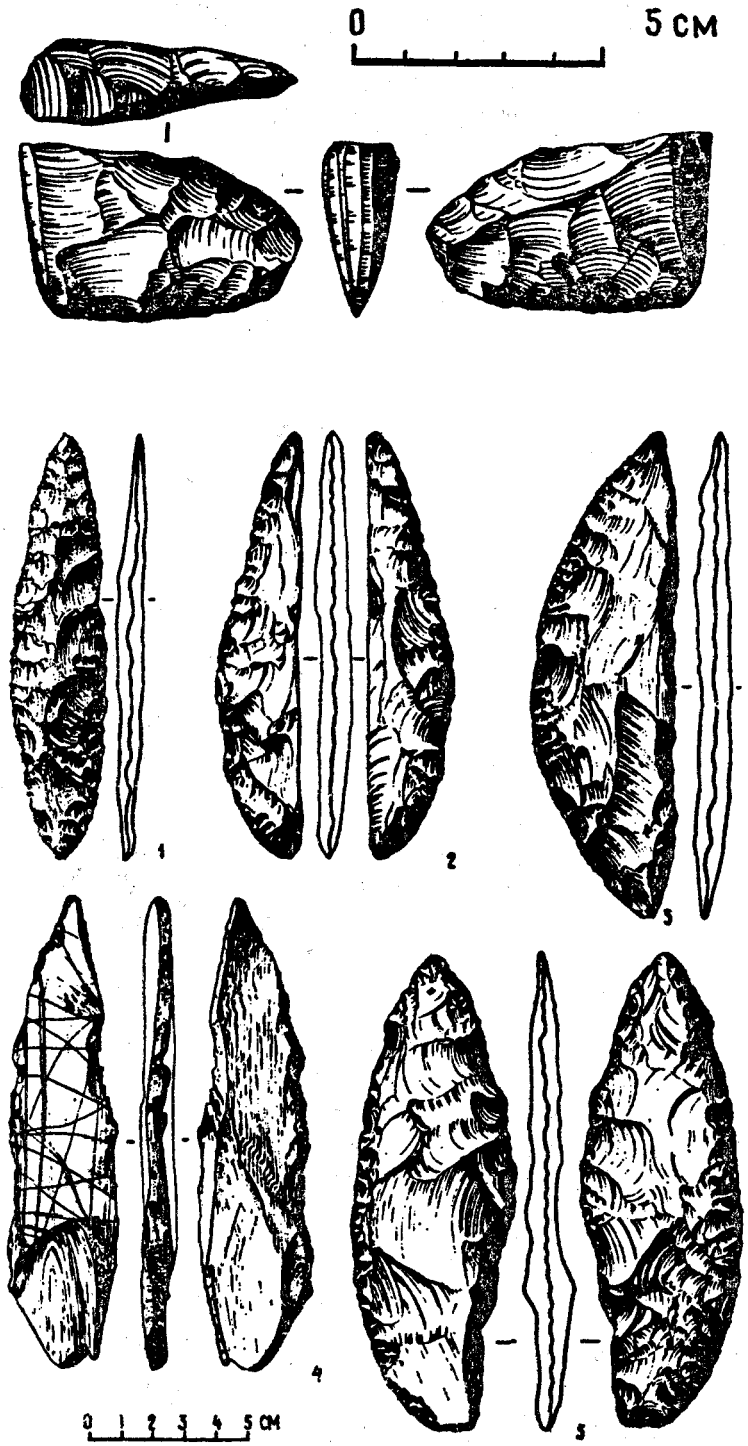


FIG. 6.

complex as on the Aldan together with an engraved and flaked plate of mammoth ivory (Fig. 6) and four carbon dates ranging from 10,600±90 LE998 to 13,420±200 IM152. Allowing for some degree of contamination (due to the presence of a melting ice-wedge) a date in the order of 12,500 can be accepted. This corresponds closely to the date of the disappearance of the final mammoth fauna deduced by N. K. Vereshchagin who has been reinvestigating the problems of the frozen mammalian remains. He has reached the conclusion that the mammoth and associated species flourished here under high glacial conditions which were certainly dry on the botanical evidence, probably as a result of permanent freezing of the Ocean. In the Holocene, however, the seasonal melting and changes in wind circulation led to a much higher snowfall which this fauna could not tolerate, coupled with the additional factor of the spread of coniferous forest on to what had previously been grassy plains.

The successful colonization of NE. Siberia during the Sartan episode of the Last Glaciation is confirmed by the important stratified site at Lake Ushki still further to the east on the Kamchatka Peninsula. Here the carbon dates range from 10,350 ±350 at the top to 21,100±900 GIN184[1] at the base. The industrial remains at this site are enriched by a varied complement of bone tools, while the lithic element (with the possible exception of basal layer) is clearly in close agreement with the partially contemporary assemblages on the Aldan and middle Lena. Although the final phases appear to perpetuate the older style, it had been abandoned on the Aldan. To the south, south of the Stanovoy Range, an interesting situation was revealed some years ago in the Amur Basin by A. P. Okladnikov and others who located a series of Upper Palaeolithic-type stations in this area with the same general characteristics as those described further north. Although clearly of Pleistocene Age on the basis of the geology and palaeontology, no C14 dates have been

[1] This date is not, however, accepted by some authors, e.g. Klein, who regard it as too old. They suggest a date in the order of 14,000 to 15,000 for this basal layer.

FIG. 6. Specimens typical of the Dyuktai Complex of the NE. Siberian Upper Palaeolithic, Middle and Late phases. Top row: four aspects of typical wedge-shaped core made on fragment of bifacial tool for production of micro-blades. Middle row: Bifacial (?) pressure-flaked leaf-point from Dyuktai Cave, dated 13,110±90 LE905 and Verkhne–Troitskaya bifacial leaf-points dated 18,300±180 LE905. Bottom row: Verkhne-Troitskaya bifacial leaf-point and copy in bone with engraved lines from Berelekh dated 13,420±200 IM152 and associated with typical stone bifacial artifacts.

published yet as far as I am aware. The land-mass is, however, prolonged to the east by the chain of islands beginning at Sakhalin and thence southwards through Hokkaido to Honshu. All these are known to have been linked to the mainland by land bridges during the Last Glaciation and have now yielded Upper Palaeolithic sites in their turn. These have now been dated in several localities, and radio-carbon readings of up to 29,300 and 28,700±920 are the oldest so far published. Some of the lithic assemblages at least associated with these are quite of the same type as those of the Amur and the Siberian complex generally.

Thus, combining the latest results with older finds is now producing a vastly different synthesis to that accepted only a few years ago. It would now seem that the whole area from the Yenisei to the Behring Straits and the Arctic Ocean to Vladivostock, contained within the rectangle of some 3,000 by 2,000 miles, was colonized well before the climax of the Sartan episode of the Last Glaciation, that the population was of fully sapient character practising a characteristic Siberian version of the Upper Palaeolithic and that such colonization had reached as far as the Verkhoyansk Mountains by 35,000 b.p. or earlier.

The question of origins is an interesting one. It has been usual among Soviet prehistorians to assume that this population sprang from an earlier one in the area, presumably practising a Middle Palaeolithic (Mousterioid or Levalloisian) type of lithic industry from which the later tradition we have been discussing could have originated by independent local evolution. As far as the most north-easterly regions are concerned, I have questioned this assumption and shown, moreover, that there are signs of an effective ecological barrier during the Middle Palaeolithic in the form of a wide belt of coniferous forest. Such a zone may be expected to have thinned during the Sartan, thereby opening the door to further expansion, or again the technology of the earliest exponents of the Siberian Upper Palaeolithic may have been adequate to enable them to penetrate it more effectively than their predecessors (in Kazakhstan and neighbouring regions south-west of Central Siberia).

More than one specialist has looked to the Amur Basin as a possible focus for such expansion, but the situation with regard to a possible Middle Palaeolithic variant in that region is far from clear; the oft-quoted traces of Levalloisian at Ustinovka, for instance, in the opinion of the present writer, are altogether inconclusive and an inadequate basis for a positive suggestion of such a kind.

At this point it may be pertinent to ask how far this pattern extended to the south-west.

Material assignable to the Upper Palaeolithic in any sense is notoriously scarce in this southern portion of Soviet Central Asia,

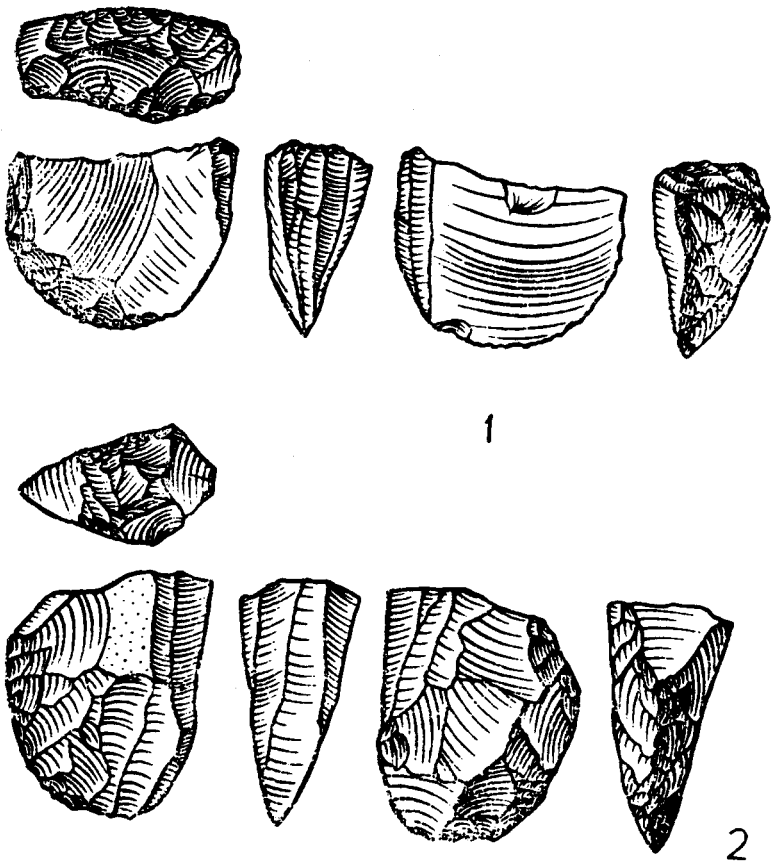


FIG. 7. Wedge-shaped cores from Upper Palaeolithic sites north of Lake Balkhash, Kazakhstan, for comparison with the NE. Siberian form seen on Fig. 6. (After A. G. Medoev (1970).)

although not altogether lacking. A. G. Medoev has recently drawn attention to a number of Palaeolithic traces north of Lake Balkhash among which are some unmistakable 'wedge-shaped' cores quite typical of the Siberian tradition (at Semizbugi)[1] (Fig. 7, nos. 1 and 2). Still further to the south-west is an oft-quoted three-level site at Samarkand, with typical

[1] Medoev, A. G. (1970).

Siberian pebble tools combined with some traces of micro-blade technique.[1]

I, myself, have had an opportunity to form some opinions on this problem based on my work just south of the borders of Soviet territory in North Afghanistan, during an expedition undertaken with the support of our Academy in 1971. I took the occasion at that time to re-examine in some detail the original Upper Palaeolithic finds of Coon near Samangan, and through the kindness of Dr. Louis Dupree, his own more recent finds both housed in the museum in Kabul.[2] I formed the opinion that throughout the Upper Palaeolithic succession here, as in Siberia, there was a considerable degree of continuity, and that the overriding features did not, in my estimate, show any significant affinities whatever with the far distant Russian Gravettian province as had been claimed. On the contrary, they all fell well within the range of the morphological variation of the discoveries in Siberia.

I am interested to see, if I understand them correctly, that A. A. Nikonov and V. A. Ranov with experience of the area near Dushanbe just north of where I was working have reached a similar conclusion (Fig. 8).[3]

During my work in Afghanistan I re-excavated Coon's section at Kara Kamar (near Samangan) and satisfied myself that there was no possibility of Mousterian to which his five published readings of over 34,000 b.p. could possibly apply. On the contrary, I found a typical Upper Palaeolithic angle burin on a blade in place in immediate contact with the rock floor at the base of the profile. Affinities with the Siberian complex are particularly clear in my opinion at Dupree's site of Ak Kupruk where they are dated to 16,615±215 (HV1358) not 34,000 as quoted by Ranov.

When we come to consider further the affinities of this Afghan material it is important to specify that the nearest finds that can be compared in any significant sense with 'Gravettian' are those from my own site of Ali Tappeh[4] in the Eastern Elburz, i.e. on the other side of the Kara Kum desert some 800 miles away. These last in fact show a striking resemblance to the later Imeretian Upper Palaeolithic complex of generalized Gravettian character in the Caucasus.

[1] Korobkova, G. F. (1972) is inclined to minimize these while admitting their presence. My own view on the published data is the opposite.

[2] Nikonov, A. A., and Ranov, V. A. (1973).

[3] Now housed in the museum at Kabul (see McBurney, C. B. M. (1972)).

[4] McBurney, C. B. M. (1973).

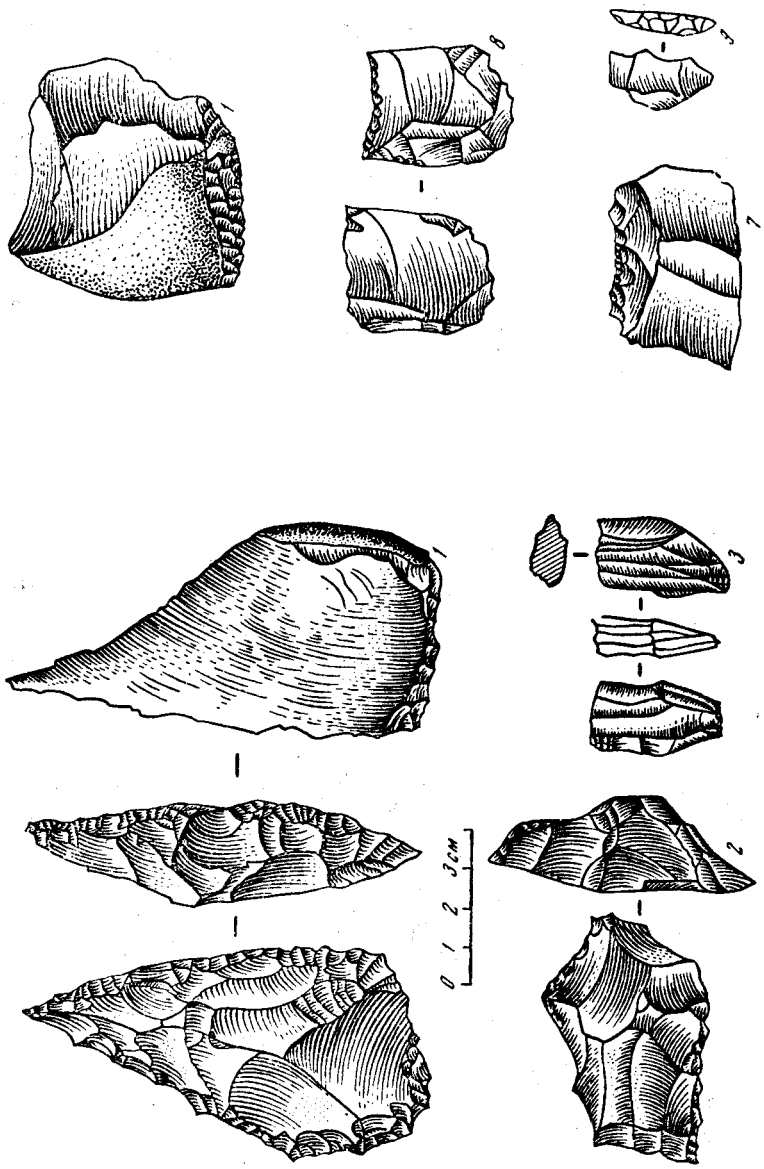


FIG. 8. Elements of the Afghan Upper Palaeolithic showing affinities with Soviet Central Asiatic sites. Large flake side-scraper and wedge-shaped micro-blade core (narrow prismatic cores for the same process are more usual, see Dupree (1971)). (After Ranov, V. A. (1973).)

Thus the emerging pattern of geographical and chronological occurrence of the Upper Palaeolithic in the Soviet Union as a whole seems to me to be assuming a coherent over-all form. It seems increasingly likely that the habits of the late Pleistocene inhabitants of the vast territory of Siberia did indeed show a degree of continuity which contrasts strongly with the West and forms a chain of mutually comparable finds from the Pacific Coast to the western slopes of the Urals (as both Bader and Boriskovski have maintained over a number of years) and extends southwards into Afghanistan.

How then are we to account for the origins of this phenomenon with its relevant dates? For, *pace* some theorists, a positive explanation or 'model' of some kind is indeed required. I have mentioned the suggestion put forward in connection with the Amur Basin. A different view has been suggested by Grigoriev, while most recently Mochanov[1] has offered another scheme according to which the bifacial element in the early NE. Siberian Upper Palaeolithic (and perhaps other elements as well) might be derived from a hypothetical hand-axe bearing Levallois-Mousterian such as that deduced by Medoev for Kazakhstan. That this particular bifacial element may have derived from this source is of course a possibility but my own alternative, which I should now like to develop briefly, is somewhat different. It is based in the first place on the absence of evidence for such an antecedent north-east of Baikal. On the contrary, as we have seen, there are valid arguments which may lead one to suspect that no penetration of these regions by man took place before one of the later sub-phases of the Karginski (the 'Malokhetsk' perhaps, cited by Mochanov) and that when it occurred it took the form of a fully developed Upper Palaeolithic already possessing all the leading features of the Mochanov 'Dyuktai Complex'. To judge from the only slightly later burials of the allied variant in Central Siberia (see for example Klein, 1973) it was practised by a fully modern physical strain of man. Of first importance then are the new data now supplied by Mochanov regarding the absolute dating of this event at or close to 35,00 b.p. If we set this against the cultural affinities I have alluded to in Afghanistan, where the first fully evolved Upper Palaeolithic reaches at least as far back as 34,000 and Iranian material reliably dated to 40,000, and, finally, take account of the most recently reported discoveries of a recognizably Upper Palaeolithic complex in South Palestine at about 46,000 b.p., it

[1] Mochanov, Y. A. (1975) gives a general discussion of variant views.

can hardly be denied that we have a prima-facie basis for a hypothesis of a very different kind. Here again as in Europe we have positive evidence that renders the former concept of simultaneous emergence of the Upper Palaeolithic over wide areas increasingly unlikely and specifically raises the possibility of radiation from a restricted focus, namely the southern sector of South-West Asia. If I may recapitulate then, the broad conclusions which seem to me to be emerging from the latest discoveries with regard to the peopling of the North, that is to say the peopling of Eurasia which I have taken as the central theme of my discourse, and reviewing my suggestions in chronological order, I would make my first point with regard to the immense time-lag between the appearance on earth of tool-making culturally endowed man, and his effective colonization of the territories under discussion. My suggestion is that this is mainly a cultural and technological problem, in which we see a prolonged period of gestation before cultural potentiality reached a level at which it could overcome specific ecological barriers or thresholds. No solid evidence of penetration can really be detected before the bearers of the Middle Palaeolithic of Neanderthaloid strain. Although these can now be traced as early as the final stage of the Penultimate Glaciation in Western and Southern Europe, the first palpable signs in any quantity in Eastern Europe and South Central Asia can hardly be recognized before the early stages of the Last or Valdai Glaciation. From then on, however, their spread is dramatic, reaching in Eastern Europe to the Arctic Ocean and extending far across the plains of Central Asia, but not, and this is my second point, penetrating the great forested zones of Northern and Eastern Siberia during the middle Würm (in Siberian terms the Karginski) interstadial complex. For effective spread into this last area, it would seem on present showing that humanity had to wait for the full development of the Upper Palaeolithic, first attested in SW. Asia and expanding thence in a steady wave northwards into Russia (to supplant the preceding Middle Palaeolithic throughout its territory with dramatic finality) and north-eastwards across the plains and mountains of Central Asia, everywhere carried by men of fully modern physique.

Human penetration of the middle reaches of the Lena and adjacent regions seems now to have been completed for the first time, before the end of the Karginski, a full ten thousand years earlier than anyone supposed until the most recent campaign of researches. The occupation of the most northerly regions of all,

the area eastwards of the Behring Straits, was complete before the end of the ensuing Sartan by culturally related groups who eventually carried right across the straits into the New World well before the end of that climatic phase.

If the cultural potential of the populations responsible for this final achievement are most vividly illustrated by the finds at Ushki and Berelekh, the essential key to archaeological understanding is supplied by the results obtained by Mochanov and his colleagues of recent years at Yakutsk. In the intervening territory to the west the most illuminating results are probably those in Cis-Baikalia and the upper reaches of the Yenisei,[1] while promise of further important discoveries is held out by the preliminary results in Kazakhstan and southwards.

Above all, one strand seems to me to be emerging with increasing clarity from the complicated pattern of the peopling of the North, and that is the crucial importance of a great surge in human affairs which seems to have affected profoundly both behavioural potentiality and in all probability gene circulation and hence the spread of new mutations during the prolonged period of climatic oscillations which mark the middle phases of the Last Glaciation.

This then is in broadest outline the working hypothesis I have to offer of the northward spread of mankind in Eurasia. It is admittedly a personal reading and as such fallible no doubt at many points. It is based in the main on published sources, though influenced by my own studies at first hand, both what I was able to see and discuss while in the Soviet Union and to study in the field from contiguous regions.

If in the long run I should prove to be substantially correct in these suggestions I and others have put forward, then it seems to me that we already possess a framework of considerable significance within which we can accommodate the unfolding pictures of regional development which the enthusiasm and energy of our Soviet colleagues is steadily providing. In any case it is certain that with such a flow of new information and critical activity we can hardly fail to check these and many other conclusions, and in the end achieve a real and lasting insight into this fascinating episode of human development.

Moreover, by unravelling the complicated pattern of interwoven factors of physical and cultural evolution in this particular and special case, we may hope to reach some deeper

[1] Although contrary to wide assumption hitherto, nothing is yet known of the initial stages here.

understanding of the whole process whereby man has reached his present condition.

In conclusion I should like to express the hope that I may at least have done something to make better known in the West some of the contributions which our Soviet colleagues are currently making to many aspects of this profoundly significant field of human history in the broadest sense. Once again I should like to thank all those that I met during my visit for their kindness and for the immensely valuable exchange of information and publications which has followed.

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