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EDITED BY
GEORGE GRANT MACCOURDY
*Director of the American School
of Prehistoric Research*

INTRODUCTION BY
JOHN C. MERRIAM
*President Carnegie Institution
of Washington*

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SOME OBSERVATIONS ON THE REMAINS OF A PLEISTOCENE FAUNA AND OF THE PALAEO- LITHIC AGE IN NORTHERN MANCHURIA

BY

A. S. LOUKASHKIN

Harbin Museum of the Manchuria Research Institute

IN 1933 I submitted to the XVIth International Geological Congress at Washington a paper on "The Post-Tertiary fauna of Northern Manchuria contemporary with Primitive Man," in which I enumerated the discoveries made to that time of the remains of a chiefly mammal Pleistocene fauna. In the following years, new discoveries were made in different parts of Northern Manchuria, thanks to which it may be assumed that the country during the Pleistocene Age was thickly inhabited by many species which at present are either extinct everywhere, or survive only in other countries of Asia situated more to the South and possessing a milder climate. We may say without any exaggeration that nearly at every point of Northern Manchuria we encounter some remains of a long vanished fauna: from the steppes and semi-deserts of the Barga in the North to the shore of the Liaotung Peninsula in the South, in the mountains of the Great Khingan and in the wide fertile Manchurian Plain watered by the Sungari and its mighty tributary, the Nonni.

Richest of all in remains of the Pleistocene fauna is the Manchurian Plain with its deposits of loess-like loam. True, a great part of the recorded places where bones have been found are those in which casual discoveries of single detached bones, or even only parts of them have been made.

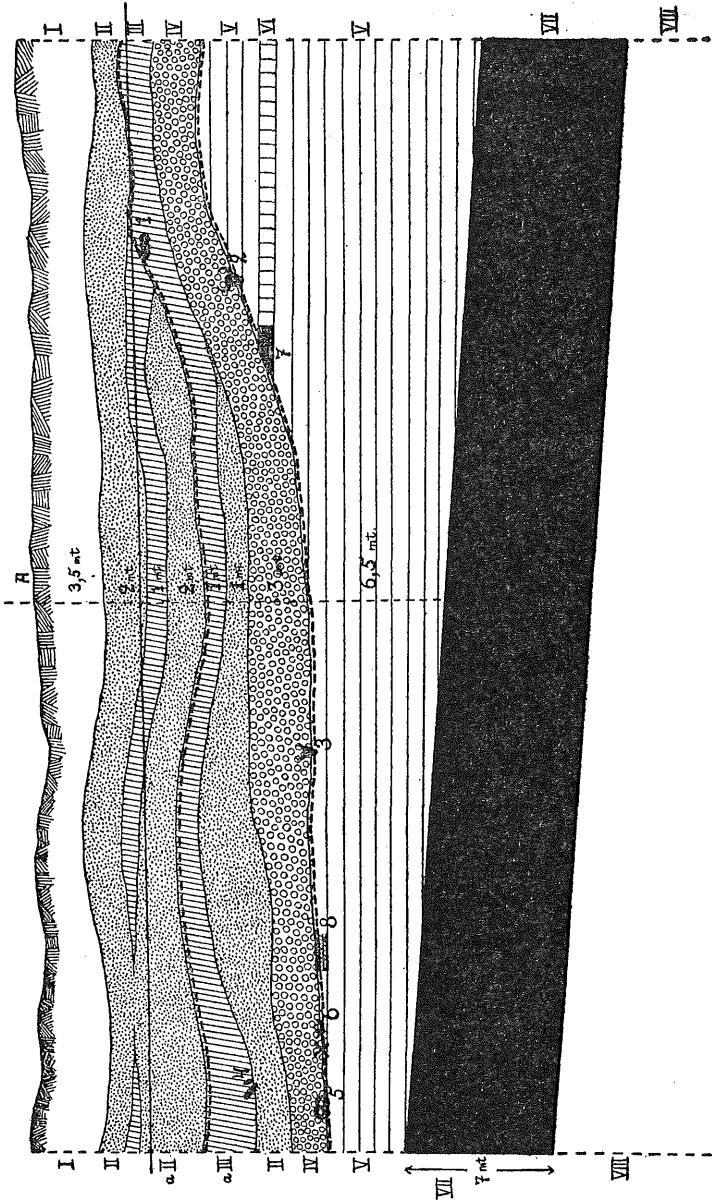


FIG. 53—(Explanation on opposite page)

Only two regions are known which have yielded more abundant finds, viz: the brown-coal mines near the Chalainor station of the North Manchurian Railway (former Chinese Eastern) in the Barga, the northwestern corner of northern Manchuria, and the region of the brickyards at Kuhsiangtun near Harbin.

In the collection of the Museum of North Manchuria at Harbin, of bones of mammals from Chalainor, brought in between 1923 and 1927, remains of the following species are represented, viz: *Elephas namadicus*, *Rhinoceros tichorhinus*, *Bos primigenius*, *Bison priscus*, *Antilope* sp., etc.

The greater part of these bones, according to the geologist Prof. E. E. Ahnert, were found at depths of from 8.5 to 13.5 meters. The strata enclosed between the depths mentioned are: the washed-out surface of early Quaternary deposits, then a bed

FIG. 53—A geological cross-section of the bone-bearing layer of Pleistocene Mammals at the Chalainor Brown Coal Mine of the North Manchuria Railway (former Chinese Eastern Railway), Barga, North Manchuria.

Explanation:

A. Ground surface.

Layers:

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| I. Chestnut-brown soil.—Modern deposits. | |
| II. Dry quicksand. | } Washed-out surface of early Quaternary deposits. |
| IIa. Wet sand. | |
| III. Compact silt. | |
| IIIa. Frozen silt. | |
| IV. Small river pebbles. | } Washed-out surface of coal-bearing deposits. |
| V. Argillaceous slate (thawed). | |
| VI. Thin tier of sandstone. | |
| VII. Brown coal. | |
| VIII. Grey clay. | |

Figures in the contact between IV and V layers:

1. Skull of *Rhinoceros tichorhinus*.
2. Skull of *Bison priscus*.
3. Skull of *Bos* sp.
4. Tibia of *Rhinoceros*.
5. Pelvics and ribs of *Rhinoceros* and *Bison*.
6. Other small bones.
7. Petrification (?).
8. Willow Wattling.

Layers included between two dotted lines—Eternally frozen ground.

(After V. P. Vodenikov, Aug. 1927.)

of eternally frozen ground, beneath which follows a stratum of washed-out argillaceous slates, which is richest in remains of a fossil fauna. The accompanying schematic sketch of a cross-section illustrates more fully the order of stratification of these beds.

The accumulation of bones of Pleistocene mammals at Chailainor is characterized by the simultaneous presence of implements of primitive Man. The same holds good regarding the second place, viz. Kuhsiangtun. But on this more later, after consideration of the Pleistocene fauna contemporaneous with the ancient dweller of Northern Manchuria.

The Kuhsiangtun deposits of bones of a fossil fauna proved to be the richest of all recorded thus far in Manchuria and perhaps in East Asia. They were quite casually discovered in 1931 in consequence of the activity of the inhabitants of Kuhsiangtun, making bricks for Harbin from the loess-like clay which composes the ancient terrace of the right bank of the Sungari River, on which stands the town of Harbin with its numerous suburbs.

In 1931, the author undertook excavations in this region together with the palaeontologist of the Peking Geological Survey, Dr. T. N. Yin, and the archaeologist V. V. Ponosov. As a result of this work an immense collection of bones, skulls, and teeth was gathered, which is now in the Museum of Harbin. Another large collection was gathered in 1933 and 1934 by the expedition of Prof. S. Tokunaga and N. Naora, which is now in the Vaseda University of Tokio.

At Kuhsiangtun, as I have written before (1932, 1933), the rich bone-bearing stratum lies at a depth of six to eight meters and lower in a thickness of loess-like clay, which consists of a few sub-strata little differing from each other, but in general more or less alike. Outcrops of these strata appear in two deep gullies, cut by the Wen-chuan-ho stream and flood-water torrents.

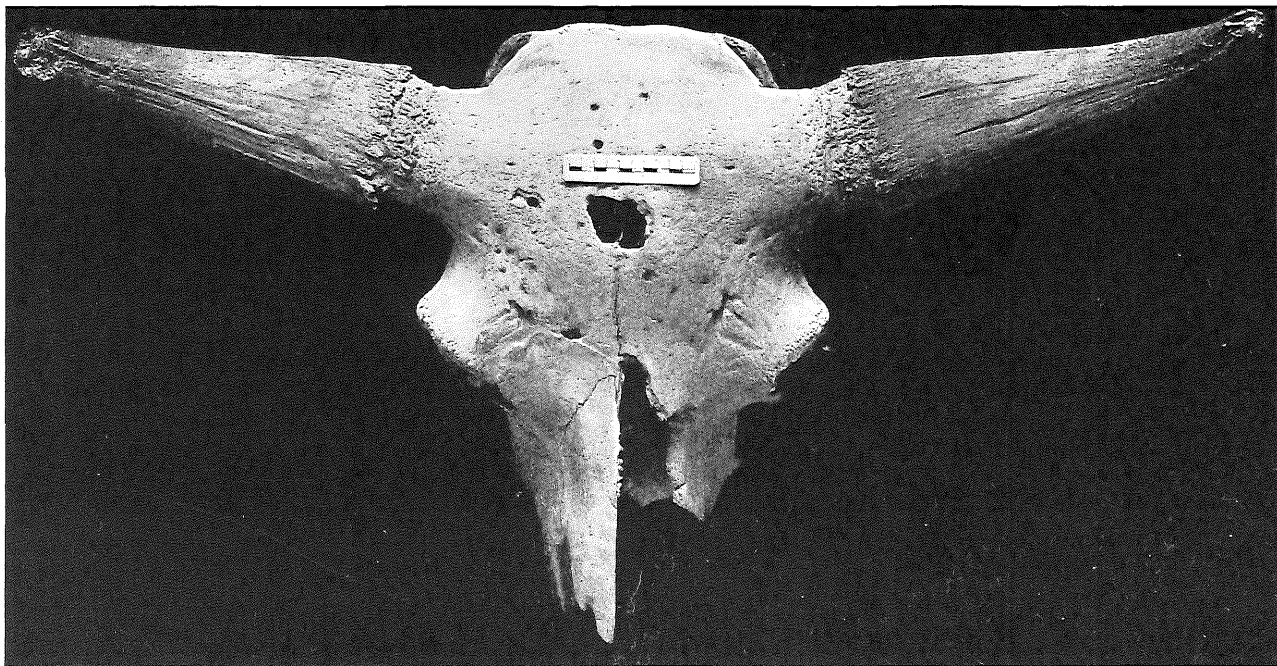


PLATE XXII—A Skull of *Bison priscus* from Kuhsiangtun Village, near Harbin, excavated in July of 1931 by the author and Dr. T. H. Yin from the wet greenish silt of the main ravine, eroded by the Hotsiagow River. Preserved in the collections of the Museum of Manchuria Research Institute at Harbin. (Upper view.) Photo taken by the Author, 1932.

After the excavations by the Scientific Research Institute of North Manchuria in 1931, partly continued in 1932 in excursions of the author and V. V. Ponosov, large-scale excavations were begun in 1933 by Prof. Tokunaga and Naora and concluded in 1934. Many private collectors of Harbin after heavy rains have secured, and continue collecting, bones washed out from the strata, so that at the present time many thousands of detached bones, horns, teeth, and skulls have been gathered.

As a result of the exploration of the bone deposit of Kuhsiang-tun during the past six years the list of recorded species of the Pleistocene fauna of Northern Manchuria has grown greatly.

According to the preliminary determinations by Drs. T. H. Yin, S. Tokunaga, N. Naora, Prof. Henry Breuil of Paris, Père Teilhard de Chardin, and the author, we have the following list of mammals, viz:

- | | |
|---|--|
| 1. <i>Canis lupus</i> L. | 21. <i>Rhinoceros tichorhinus</i> Cuv. |
| 2. <i>Canis</i> sp. | 22. <i>Rhinoceros</i> sp. (<i>sinensis</i> ?) |
| 3. <i>Vulpes</i> sp. | 23. <i>Rhinoceros</i> sp. (<i>mercki</i>
Jäger) |
| 4. <i>Hyaena ultima</i> Matsumoto. | 24. <i>Equus hemionus</i> Pall.
(Var. ?) |
| 5. <i>Hyaena</i> sp. | 25. <i>Equus caballus</i> L. |
| 6. <i>Felis</i> sp. | 26. <i>Equus</i> cfr. <i>ferus</i> Pallas. |
| 7. <i>Tigris tigris longipilis</i> Fitz. | 27. <i>Moschus</i> sp. |
| 8. <i>Putorius (Mustela)</i> sp. | 28. <i>Capreolus mantchuricus</i>
(Noack). |
| 9. <i>Meles</i> sp. | 29. <i>Capreolus</i> sp. ? |
| 10. <i>Ursus</i> sp. | 30. <i>Cervus canadensis xanthopy-</i>
<i>gus</i> A. Milne-Edwards. |
| 11. <i>Tamias</i> sp. | 31. <i>Cervus (Euryceros) pachy-</i>
<i>osteus</i> Young. |
| 12. <i>Pseudosciurus</i> sp. ? | 32. <i>Cervus (Euryceros) ordosi-</i>
<i>anus</i> Young. |
| 13. <i>Arctomys (Marmota) sibi-</i>
<i>rica</i> (Radde). | 33. <i>Cervus elaphus</i> L. (?) |
| 14. <i>Microtus</i> sp. | 34. <i>Cervus</i> sp. ? |
| 15. <i>Myospalax epsilanus</i> Thomas. | 35. <i>Megaceros</i> sp. |
| 16. <i>Citellus dauricus</i> Brandt. | |
| 17. <i>Chaliodomys</i> sp. ? | |
| 18. <i>Arvicola</i> sp. | |
| 19. <i>Ochotona</i> sp. | |
| 20. <i>Lepus</i> sp. (<i>tolai</i> Pall. ?) | |

- | | |
|---|--|
| 36. <i>Rusa</i> cfr. <i>elegans</i> Teil. | 48. <i>Capra</i> (<i>Spiroceros</i>) <i>kiach-</i>
<i>tensis</i> Pavlova. |
| 37. <i>Rusa</i> sp. ? | 49. <i>Bos primigenius</i> Boj. |
| 38. <i>Pseudaxis grayi</i> Zd. (var. ?) | 50. <i>Bos</i> cfr. <i>taurus</i> L. ? |
| 39. <i>Pseudaxis</i> sp. ? | 51. <i>Bibos</i> sp. |
| 40. <i>Sika nippon mantchuricus</i>
Swinhoe. | 52. <i>Bison priscus</i> Boj. |
| 41. <i>Palaeotragus</i> sp. ? | 53. <i>Bison</i> sp. |
| 42. <i>Alces</i> sp. | 54. <i>Bubalus teilhardi</i> Young. |
| 43. <i>Rangifer tarandus</i> L. (?) | 55. <i>Probubalus</i> sp. (<i>triquetri-</i>
<i>cornis</i> Rutimeyer?) |
| 44. <i>Gazella</i> sp. (<i>gutturosa</i> Pall.). | 56. <i>Camelus</i> sp. |
| 45. <i>Gazella</i> sp. ? | 57. <i>Giraffidae</i> sp. ? |
| 46. <i>Nemorhaedus raddeanus</i>
(Heude). | 58. <i>Elephas primigenius</i> Blum. |
| 47. <i>Saiga tatarica</i> (L.) ? | |

Besides remains of mammals at Kuhsiangtun have been found a bone and egg-shells of the ostrich (*Struthio* or *Struthiolithis*), bones of the soft-armored turtle (*Amida maacki*), and fin-bones of the swallow-fish (*Pseudobagrus* sp.).

Of the enumerated finds the most interesting are the remains of the giant deer, *Megaceros*, *Euryceros*; of the fossil buffalo, *Probubalus triquetricornis*; of the ostrich; the deer, *Rusa*, *pseudaxis*; the giraffe; the screw-horned antelope (*Spinoceros kiach-tensis*), etc.

Of the discoveries made lately in other parts of Northern Manchuria, particular attention is warranted by that of the upper part of the skull with the horns of a wild sheep, *Ovis* sp., which in the summer of 1934 was brought up by fishing nets from the bottom of Lake Dalai-Nor (Barga), not far from Chalainor station; it is now in the private collection of Archimandrite Nathanael Lvov of Harbin. This discovery and that of horns with part of the skull of the screw-horned antelope explodes the assertion of some zoogeographers to the effect that Manchuria has always remained outside of the area of representation of the members of the families of the wild sheep and goats. (Nasonoff, N. V., 1919).

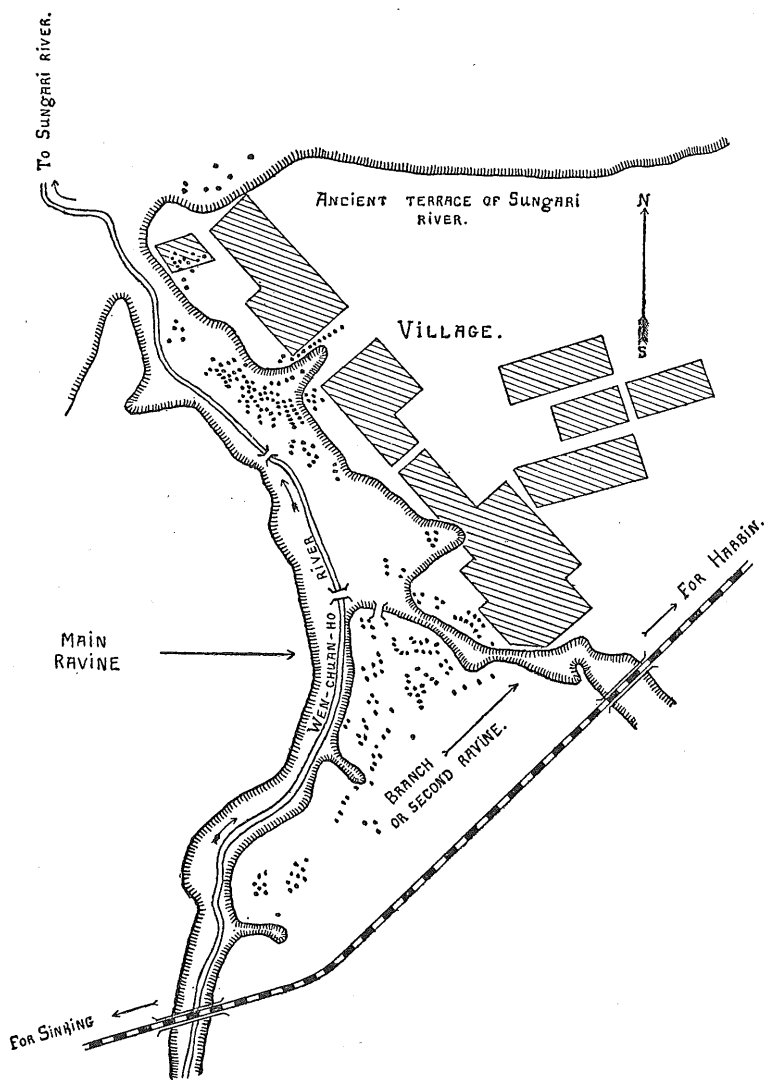


FIG. 54—A sketch plan of the Kuhsiangtun Village, suburb of Harbin (Northern Manchuria), where fossil bones of Pleistocene fauna and Palaeolithic bone and stone implements were excavated during 1931-1934.

Summing up and analysing the fossil fauna of the Pleistocene I take the liberty to repeat the formerly (1933) published particularities and characteristics of the latter.

1. From the point of view of contemporary zoogeographers, the Pleistocene fauna of Northern Manchuria is represented by various forms which give it an unusually complex and special character. Together with the representatives of the north, such as the elk, mammoth, and hairy rhinoceros, southern forms, such as the buffalo, hyena, and tiger, flourished. Another interesting peculiarity of the varied mixture of forms is that it comprised animals differing exceedingly in their characteristic habitat-typical plains forms, such as the hare, bison, antelope, and ostrich, and even typical desert forms, such as camels, existing side by side with typical forest forms, such as the ox, elk, reindeer, bear, and many others related to inhabitants of the high mountain regions of today.

2. The second striking feature shown by the remains found is the existence, in association with typically Pleistocene animals, of forms characteristic of the Tertiary fauna. To this category among others belong buffalo (*Probubalus triquetricornis* ? Rutimeyer) and a second species of rhinoceros (*Rhinoceros* sp., possibly *R. mercki* Jäger). This association indicates that in Northern Manchuria these animals existed considerably longer than in other localities and survived into the Pleistocene. Several lines of evidence indicate that, favored by the absence of a glacial epoch in Manchuria, numerous forms probably survived into relatively recent times. In Chinese chronicles are preserved several references to oxen and rhinoceros contemporary with men.

3. In the fossil remains of the ancient fauna of northern Manchuria we also find forms that exist in other countries at present—for instance the camel, hyena, and ostrich—and some that are still living in Manchuria, the long-haired Manchurian tiger (*Tigris tigris longipilis* Fitzinger, the wapiti (*Cervus canadensis xanthopygus* Milne-Edwards), the roe deer (*Capreolus mantchuricus* Noack), the antelope, and others. Not without interest is the finding, in Kuhsiangtun, of the bones of the soft-shell turtle (*Amida maacki* Brandt), which lives at the present in the ravines and lakes of Manchuria. All these facts put together confirm the existing opinion that

the contemporary fauna of Manchuria is a relict fauna preserving many animal and plant forms surviving from the far past of the country.

Proceeding now to the Palaeolithic Age of North Manchuria I must say that already in 1931, when I was at work excavating in the bone deposit of Kuhsiangtun together with the archaeologist V. V. Ponosov, I took notice of two circumstances calling for attention. Notwithstanding the richness of the bone deposit we did not find one single complete skeleton. Even the skulls were without lower jaws. All the bones were scattered and mixed up. The second circumstance, most astonishing to me, was the abundance of small fragments of bones, a great percentage belonging to the hollow ones rich in marrow, which for the greater part proved to be broken lengthwise.

All this taken together gave me the right to advance, in 1932 in my article "Recent Discoveries of Remains of Pleistocene mammals in Northern Manchuria," my query,— are not the bone deposits of Kuhsiangtun kitchen refuse of the Palaeolithic hunter of North Manchuria? This conclusion was reached, after, during our excavations, we chanced upon small lumps of charcoal. As a corroboration also served the discovery by Prof. Breuil on some bones in the collection of the Museum at Harbin of traces of fire and even of notches and scratches, not produced by natural wear and tear, but more likely by the hand of Man. Just then V. V. Ponosov found the first stone implement, made of rock-crystal in a very rough way, similar in type to the quartz implements of the *Sinanthropus pekinensis* from Choukoutien.

According to F. A. Velevskiy (V. J. Tolmachoff, 1932), among the bones of mammoth, rhinoceros, and others which were fished out of the Sungari River off the town of Harbin (derived from the banks below the mouth of the Wentsunho rivulet), there was one stone distinguished by its particular

shape, which apparently had been given to it artificially. Unluckily, this implement was lost afterwards.

In the course of the excavations of Kuhsiangtun in 1933 and 1934, Prof. S. Tokunaga and his assistant N. Naora gathered an extremely large collection of bone fragments showing traces of having been worked by Man, also some implements and working refuse.

To judge from the photographs accompanying the reports of the savants mentioned, but very few of them may be considered as true bone implements. The first place among them is doubtlessly occupied by a wonderfully preserved object of bone which is well and neatly polished. This implement looks like a prick or stylet of oval cross-section, from which the peduncular part has been struck off. The length is 140 mm., the width at the base 14 x 8 mm. It is distinguished by a high polishing technique. Three other implements are of considerably coarser workmanship than the first, but they deserve attention. They are all made of mammoth tusks. A halberd-shaped implement is 217 mm. long and 51 wide, a scoop-shaped one 230 mm. long by 120 wide, and a spear-handle-shaped implement has a length of 120 mm.

The stone implements of the collections of Messrs. Tokunaga and Naora are for the greater part fragments and working refuse rather than finished implements.

Regarding quality of workmanship, first place among them is taken by a tiny curved scraper of bluish-grey opal, measuring 30 x 26 mm. and showing careful retouch at the working edge. Then follow larger scrapers of basalt and measuring 52.5 x 32 and 50 x 20 mm. of liparite having a length of 28 and a width of 53 mm. We note three other implements, which the savants mentioned classify as "willow shape" implements. Two of them are made of chert and have dimensions of 42 x 27.5 and of 34.5 x 26.5 mm., respectively, while the third one, of quartz, measures 61 x 25 mm. Thus we see that all these implements are of small

size. The only large stone object is a lump of basalt of an irregularly triangular shape, measuring 126 x 98 mm., which shows traces of working on two of its borders.

In 1934, Archimandrite Nathanael Lvov and the archaeologist V. V. Ponosov also collected some stone implements, two of which are very interesting; one of them is a medium-shaped scraper-nucleus, the other one an elaborate little scraper-lamel.

The excavations by the Scientific Research Institute of North Manchuria in 1931 and by the expeditions of Prof. S. Tokunaga and N. Naora in 1933 and 1934, were conducted in the main gully, at the bottom of which the Wenchauho flows, i.e. on that spot where the banks of the rivulet and of the gully have suffered most of all, both from the river itself and from the activity of the brickmakers of Kuhsiangtun. The bones and the stone and bone implements accompanying them were washed out by the river from the strata in the mass of loess-like clay and buried again in a disturbed order in its bed in the silt.

Prof. S. Tokunaga and N. Naora think that the bone-bearing stratum examined by them at a depth of one to three meters below the bottom of the gully "shows absolutely no sign of its having even been disturbed either by human hands or by the forces of nature, but it remained entirely as a natural deposition."

Personally I am of a different opinion, particularly since in the autumn of 1934 V. V. Ponosov and I found an undisturbed bone-bearing bed in the comparatively recently formed second gully (to the right) where it is marked at a depth of six to eight meters (according to a measurement by Ponosov). As the places of the excavations of 1931, 1932 and 1934 are considerably lower than this stratum, it is evident that all the bones and implements occurring there were washed out by the river from the bone-bearing horizon in a comparatively recent past, and they cannot be considered, of course, as undisturbed natural depositions.

In all probability even the whole bone-bearing stratum within

the thickness of loess-like clay at Kuhsiangtun does not represent in itself the place of the original deposition of the bone, but rather one of secondary deposition. The bones, together with masses of the loess-like clay washed out somewhere upstream, migrated downward and formed the present deposits where Kuhsiangtun is now standing.

Thus, the place of the primary burial of the bones, and the traces of the Palaeolithic encampments, is to be looked for somewhere higher up on the ancient terrace, towards the East.

The second gully, in the bone-bearing stratum from which the stone implements were taken by Archimandrite Nathanael Lvov and V. V. Ponosov, having suffered less from natural conditions and the brickmakers, ought to draw the attention of explorers to more careful excavations, which may lead to interesting and valuable results and give us an idea of the remote past of Manchuria. I am not afraid of exaggeration in stating that to the deposits of Kuhsiangtun is reserved no small part in unfolding the archaeology of this country.

Comparing the stratigraphical conditions of the deposition of the bones and stone implements near Kuhsiangtun with those in the Palaeolithic encampment on Verholenskaya Gora near Irkutsk, we may say that they are identical; both belong to the type of the loess camps.

The implements collected by Prof. S. Tokunaga and N. Naora have been referred by these savants, in comparison with the chronology of the European Palaeolithic, as "Moustie" or "Orignan." The archaeologist Ponosov likens them on account of the type of their workmanship to the "Magdalen."

Conceding to Kuhsiangtun first place in importance for its rich remains of the Pleistocene fauna and the occurrence of implements of the Paleolithic type, the second place belongs to Chalinor, about which I have spoken above.

Though it has already frequently been pointed out in litera-

ture, I would repeat once more that at Chalainor in a stratum containing bones of the mammoth, bison, rhinoceros, and other mammals, at a depth of from 8.5 to 13.5 meters, human artifacts were discovered which preliminarily are to be attributed to the Palaeolithic rather than to the Neolithic. In 1927, P. A. Pavlov brought thence the butt-end of an axe made of a filed round piece of a deer's antler with a T-shaped cross-opening bored through it. This butt-end is rather well worked, and polished by use. Its size is 95 x 85 x 30 mm.

There also was found another piece of deer's antler 600 mm. in length with the tines struck off and a ring-shaped filing in the middle which for some reason has not been finished. Both these objects, as well as the fossil bones of mammoth and rhinoceros found together with them, are in an equally complete state of preservation, and covered with the same dark patina, being at the same time equally silicified, i.e. petrified.

At the same approximate depth, but in another place, a wattling of willow twigs measuring 500 x 2000 mm. was found, of the same type used by fishermen for closing a river. Not far from the wattling a fragment of a tree was found, rudely worked into a board measuring 400 x 1000 x 70 mm.

Unluckily, both these finds became lost to science forever, for the administration of the mine left them at the working place without taking photographs of them or protecting them.

In 1934, in the same mine, a human skull was discovered, apparently a female one, but it is unknown from what depth and from which stratum. In structure it is *Homo sapiens*. Its whereabouts at the present time are unknown.

In the Museum at Harbin is a part of the upper part of a female human skull, secured by Mr. Pateleyev in 1927 from the mouth of the Urshun River, where it was brought up from the bottom. This locality is on the eastern bank of Lake Dalai Nor, about one hundred kilometers west of the Chalainor mines. This

skull is very old and has rather strongly developed eye arches. Perhaps it belongs to the later Palaeolithic.

Of other localities "suspected" as Palaeolithic, we may mention Hailar (Barga), where on a sandy blow-out, during the explorations of Neolithic encampments in 1928, working refuse and half-worked river pebbles of medium size were discovered, which by the shape of their finish and a more ancient aspect were distinguished from the typical Neolithic implements of this region. At the same place a vertebra of a rhinoceros was found, on which were preserved traces of scrapings with some sharp tool like a chisel, clearly not caused by the teeth of some beast of prey, as was thought first.

In 1934 the author discovered a fine natural cross-section in the diluvial sediments of the ancient terrace of the right bank of the Argun River near Hailar station, where he collected some bones of rhinoceros, mammoth, fossil horse, ox, bison, and deer. This place is still waiting for exploration, which perhaps may produce traces of the Palaeolithic there.

In conclusion we may say that the first steps in the realm of the exploration of the Palaeolithic Age of North Manchuria have led the explorers to concrete results in that the existence of this most ancient human culture may be considered as proven. Traces of human activities in the shape of implements, though not numerous, have been discovered. It is still left to discover Man personally. We hope that this second and concrete problem which is still before us, will be solved, too, by the united efforts of interested persons and scientific institutions, perhaps in a not so remote future.