INSTITUTE OF CURRENT WORLD AFFAIRS

RFG - 25
Ancient African Hardware

c/o Barclays Bank
Arusha, Tanganyika
July 31, 1956.

Mr. Walter S. Rogers
Institute of Current World Affairs
522 Fifth Avenue
New York 36, N.Y.

Dear Mr. Rogers:

Traveling through the highlands of East Africa, I have begun to sense the durability of the elevated geological shield which constitutes the interior African plateau. Tectonic events in the history of the continent produced rift valleys, mountains, and volcanoes, but the great elevated land mass remains basically unchanged. The Pleistocene period brought great climatic changes to Africa, as elsewhere in the world; but unlike Europe and North America, the fluctuations of climate in East Africa were not so extreme as to produce continental ice sheets which precluded the existence of man.

This situation of dynamic but limited geological changes on the surface of a stable and durable continent might be expected to provide a fitting environment for the evolution of such a species as Homo sapiens, which is generalized and primitive in its general morphology, but specialized in mind and manual dexterity, and highly adaptable to change. In fact recent finds of human fossils and artifacts have lent probability to the idea that Africa may have been the principal cradle land of the human race. Although most of the discoveries so far have been made in South Africa, East Africa has provided fragmentary but important evidence of man going far back in the Pleistocene period. Dr. Leakey found human skull fragments at Kanam and Kanjera near Lake Victoria in Kenya which are dated at early or mid Pleistocene, while a skull found at Lake Eyasi has been roughly equated with Homo rhodesiensis. A wide variety of stone-age tools have been found in East Africa, ranging in age from earliest paleolithic to neolithic. In Tanganyika the most productive site has been at Olduvai Gorge in the southern Serengeti.

The existence of evidence of paleolithic industries on the shores of Lake Manyara seems to have been generally known, but so far as I know no reports have been published on these sites, nor have any systematic excavations been undertaken. About two months ago, Betty and I set up a field camp at Mbugwe at the south end of Lake Manyara. As I walked about the Mbugwe plain, from time to time I found flakes of white flint which had obviously been brought from some distance away. Some of them resembled stone-age implements which I have seen in museums. The native Wambugwe call these flint chips kepopo and use them for roughening the stones with which they grind grain. I became more and more curious about the source of the flints. One day I stopped to examine a cutting for a road which the P.W.D. is building through Mbugwe to join up with the escarpment road from Magara to Mbulu (see RFG - 16). About two feet below the surface of black soil was a layer of gravel--probably the bed of an ancient inlet stream to Lake Manyara--which contained a number of small flint chips and also a concentration of small animal bones and the remains of crustaceans. The flints were small--few were more than an inch long--and would probably be classified as a mesolithic industry. Here at some period in the

dim past a band of stone-age people had camped and exploited the abundant animal life on the shores of lake and stream. Assuming it to be late or post Pleistocene time, the view from their camp was probably much the same as today: the escarpment, mountain ranges, and volcanoes were already formed. Lake Manyara, though, was many feet higher than its present level, the streams feeding it were perennial rivers, and the vegetation was lusher than today; for the rainfall must have been considerably higher than now.

Although I have found a few more of these small flints scattered over the plain, no more sites have come to light--only the one glimpse of human existence at a comparatively late period in evolution, when man had probably already attained his modern form. The next event recorded in my diary which pertained to archeology was an abscessed molar which goaded me to drive to Arusha for an emergency extraction. On the way back that evening, Betty and I stopped along the road at milepost 60 in response to the call of nature. There by the side of the road I saw a number of larger and better-formed flints than I had found at Mbugwe. We spent the remaining hour till dark exploring the area, and were amazed at the abundance of stone implements to be found on the surface. Our imaginations were fired, and we devoted the next week to an investigation of that region. I shall summarize our findings in this letter. The site should be well worth excavating by a competent archeologist. In addition to a sequence of stone industries, I think he would stand a good chance of discovering significant human fossils.

Just after the rainy season in wet years, the waters of Lake Manyara spread over an area 30 miles long by 10 miles wide. At present, after two exceptionally dry years, the lake bed proper is dry, though there are large swamps at both ends of the lake where the principal streams enter. The lake is bounded on the west by the escarpment of the Rift Valley. The narrow slope of fertile land between the Escarpment and the lake is being alienated for European farms. On several safaris along the west shore of the lake I found no evidence of stone-age occupation by humans. To the east of the lake, the land rises gently to the Ntarengiri Forest, and further north to the Essimingur Range. A broad stretch of grassland extends eastwards from the present lake bed. A series of low ridges running north and south through the grassy slope were no doubt former beaches of the lake; for it is generally agreed that the Pleistocene glacial periods of Europe were represented in Africa by periods of increased rainfall or pluvial periods. The Great North Road 60 miles south of Arusha follows the crest of one of the ridges. A block of 45,000 acres of grassland between the road and the lake has recently been alienated for ranching purposes. The owner, an American named Riddlesbarger, has organized a company called Farrab Inc. which has also bought a number of coffee estates in Tanganyika. The Masai name for the place is Mswakin. The ranch is now being cleared of bush and tsetse fly in preparation for cattle grazing by a manager named Campbell, who has his camp about a half mile off the road at milepost 60. Mr. Campbell was very helpful during our exploration of the Mswakin area.

The ridge at milepost 60 is crossed by a narrow ravine which is closed over and forms a tunnel through the western portion of the ridge. The watercourse below the tunnel is littered with flint tools and large fragments of pebbles. In the tunnel itself we found large nodules of native flint embedded in the walls. These weighed from 5 to 30 pounds and many

were of a contorted multiglobular shape. This place was undoubtedly a mine where the ancient flint workers obtained raw material for their tools. The floor was covered with recent cave-ins from the roof and sides, so that no flints were visible on the surface. Excavation below the floor of the cave would no doubt yield rich finds. We did no actual excavation in our survey, but only collected a sample of surface artifacts.

Within a stone's throw of the ravine there are several pits made by the P.W.D. to obtain gravel for the road. The loose gravel on the bottom of the pits contains flints which were dislodged from strata below the surface. More flints appear in the cut sides of the pits. About half of these pit flints are pure white in color and have sharp bevels. The rest have been rolled by water: the edges and bevels are blunted and they are covered with a yellow patina. My tentative interpretation is that both kinds of tools were made in one tradition, that the marked difference in surface texture is due to the accidental factor of whether they were deposited in a protective matrix of soil and gravel or were left vulnerable to water rolling on the surface. A careful excavation, however, might reveal that two different industries, widely separated in time, are represented by the sharp white and the blunt patinated flints.

One of the P.W.D. pits goes through a layer of volcanic tuff about a foot thick which covers a bed of clay and shale. This material was almost barren, with only two or three small flints appearing in the sides of the pit. The detritus in the bottom of the pit contained some larger tools, and I found several fragments which might be from a petrified skull. I have preserved these for further analysis under more favorable conditions. There are other gravel pits in the immediate vicinity which I only had time to investigate by a cursory inspection. In external appearance the ridge is a level uniform feature, but the pits which have been dug within the space of several acres reveal a variety of cross sections. Layers of coarse gravel, clay, wind-blown deposits of earth, and volcanic material are superimposed in different orders in the different pits. This is a reminder that in late Pleistocene times tectonic movements in the Rift Valley have caused frequent local changes in surface configuration, reversals of drainage slopes, and the like. The smooth contours and uniform level of the ridge are probably the result of wave action at a time when the ridge served as a beach for a much larger Lake Manyara. This situation should be inviting to an archeologist with an eye for geological interpretation.

Two miles north across the plain from Mr. Campbell's camp there is a complex of ridges branching off from the larger ridge mentioned in the preceding paragraphs. One of the ridges has been breached by a gully through which water drains in the rainy season from the sloping land above. The Farrab people plan to build a dam there to form a watering pond for livestock, and have already dug a preliminary trench twelve feet deep at that point. I spent two days investigating the trench and the adjoining ridges. The whole area is rich in surface flints, though the local source of the flint nodules escaped me. The trench is dug through solid clay which is firm, but damp and malleable an inch or so from the dried surface. The sides of the trench were sparsely studded with small flints, both clean and with yellow patina. One could not help but reflect that if this clay were elevated and exposed to water erosion, the concentrated flints left on the surface

would be quite abundant. About six inches from the bottom of the trench was a fragment of what appeared to be bone. I managed to tease out two pieces, each the size of a half dollar. These fragments were 4 mm in thickness. They were heavy and mineralized, but soft and friable as a result of their position in the damp clay. Allowing for postmortem flattening from pressure, they might possibly be pieces from the parietal bone of a human child, or they might be from an animal skull. No other animal remains could be seen in the cleanly cut sides of the trench.

From the P.W.D. pits and from the ridges around the dam site, we collected about a bushel of flints to bring back to camp and classify. These were picked up from the surface more or less at random. They varied in size from large pebble tools weighing two or three pounds and measuring six or seven inches in length down to small, neatly-chipped, flake tools an inch and a half long. The small microliths which we found at the Mbugwe site did not appear at Mswakin. Most of the larger tools were choppers or hand-axes four or five inches in length. The simplest of these were made from a suitably shaped pebble which had been split in half longitudinally. As a slight advance on that simple technique, several flakes would be knocked off the edge from the flat side, so that the cutting edge was more in line with the center of gravity of the tool. More often the tool was made by chipping off two or three flakes from each side of the cutting edge. If the pebble was of the right size and shape, the rest of the tool was usually left untouched with its natural cortex. But in many cases it was necessary to knock flakes from the butt to form a convenient hand-grip. The flint nodules which provided the raw material for these prehistoric knappers were often contorted in shape. Some of the specimens that we collected had apparently been abandoned unfinished because the flakes would not run true. In fact one does not expect to find the best examples of stone tools on the site where they were made: the most perfect pieces would naturally be taken away to camps to be used in the daily work.

The conventional distinction between "core" and "flake" tools was difficult to make with our material. The policy governing this industry seems to have been to use the whole pebble whenever its natural shape allowed. But very often the pebble had to be split or flaked in several places in order to get the required shape. In these cases it would be arbitrary whether to call it a "flake" or a "dressed core." The cutting edges of these large tools also varied in shape. Some of them were flaked on all sides to produce a single sharp point which must have been used as a pick. Others had been shaped to have a blunt point, as if to be used for some crushing purpose. The majority had a curved cutting edge about two inches long. These tools probably deserve the name "hand-axe." Flat tools with thin, straight cutting edges might be called cleavers. One can only conjecture as to the exact use of these tools. Those with undamaged edges were probably used for cutting soft material--perhaps skinning and cutting up animals. A fair proportion of the edges, though, were blunted as if they had been used for chopping wood, horn, or bone.

The next general class of tools were about the size of the hand-axes. They were thinner proportionately and were either made from flakes or thin plates of natural flint. The cutting edges of these medium-sized tools were generally longer than in the case of large choppers and hand-axes. I found no clue to their use. We must bear in mind that these ancient hunters

probably used a selection of perishable materials which required intermediate cutting tools for their manufacture--skins, tendons, wood, grass, horn, and the like. The most common of all the stone tools were those with flat bottoms and beveled edges, which are usually called "scrapers." The scrapers in our collection could be divided into a number of subdivisions according to their size, and shape. The larger ones had the general appearance of a tortoise shell. The bottom, as in nearly all the scrapers, was the slightly convex bulb of a single flake. Chips were knocked off from the end or, in some cases, all around the tool to form a cutting or scraping edge with an angle of about 30 degrees.

The smaller scrapers could be sorted into two main groups. Most of them were made from a single flake of flint, usually oblong in shape. The edge was beveled along one end and two sides, the other end being knocked off squarely. The chipping on some of these small scrapers was very precise and fine. The other group of scrapers were made from small cores: the bottoms were flat, as in the case of the flake scrapers, but the top was carinated. The scraping end tended to be pointed and the other end was square. The pointed, carinated scrapers merged into another class of tools in which the intention was not to produce a broad scraping edge, but rather to make a narrow incising or engraving tip as in a burin. In order to make the cutting tip more slender and sharp, the forward part of the hump had been chipped away in some cases, leaving a rostellate-shaped tool. Altogether we found six implements which were classed as burins.

The last important class of flint tools may be described as blades. The simplest of these were long, slender, three-sided fragments with the natural cortex usually forming one of the sides. In the more elaborate ones, the intention of the craftsman seems to have been to strike off a flat blade with a rhomboidal cross section, like the blade of a chisel. In some cases one end had been beveled so that the tool looked like a chisel blade. In others, one of the sharp edges had been blunted; these were probably used as knives with the fore finger placed on the blunt edge to exert pressure. These knife-like blades were the most fragile of all the tools, and most of them had been broken.

On my last day in the field, I walked westwards about half a mile from Mr. Campbell's camp to examine a very low ridge. A few white flints appeared on the western slope of the ridge, and in places there were collections of large, dark-colored stones which at first I took to be natural stones. On closer examination, I noted that some of these had the shape of very crude hand-axes. They were composed of material which was not well adapted for flaking--coarse chert, granite, conglomerate, and shale. I convinced myself that these were rude tools fashioned by human hands. The flaking scars are still perceptible, though the sharp edges have all been smoothed by the accidents of untold time. Some of these tools were primitive versions of the classical stone hand-axes--the so-called coup-de-poing. Others, made from plates of chert or shale, appeared to be chopping tools or cleavers. The smaller pieces were less convincing to a doubting mind, but I could clearly see in them the early forerunners of flint scrapers and cutting tools. The critical evidence, as I judged, was the presence of flake scars around the edge. The probability of these scars being produced accidentally by nature is certainly remote. If my

interpretation is correct, these stones deserve the name "eoliths"; they must be relics from the very dawn of human culture.

With the limited time available, my investigation of the Mswakin sites was necessarily superficial. I would only like to bring their existence to the attention of American archeologists. A single season of excavation by a well-equipped expedition might be enough to establish a chronology so that the Mswakin flints could be related to archeological discoveries in other parts of Africa. The significance of the eoliths might be cleared up by new discoveries which can only be guessed at now.

Sincerely,

Robert F. Gray.

P.S.: Since I finished typing this letter, I have been put in possession of microliths gathered from the same general area as the larger flints. One of the scientists from a Sleeping-Sickness research camp in the Ntaringiri Forest, whom I had visited and alerted to be on the lookout for flints, brought me some implements which included neatly chipped microliths--semi-lunar blades and triangular pieces which might have been small projectile points. After that Mr. Campbell drove up to our camp with an assortment of flints including some microliths. He also brought a box of petrified bones which he had found in laying out a new dam site. At a quick glance, this collection contains elephant teeth and bone fragments of both massive and small animals, all heavily fossilized. It might be advisable to attach a paleontologist to the expedition.

R.F.G.

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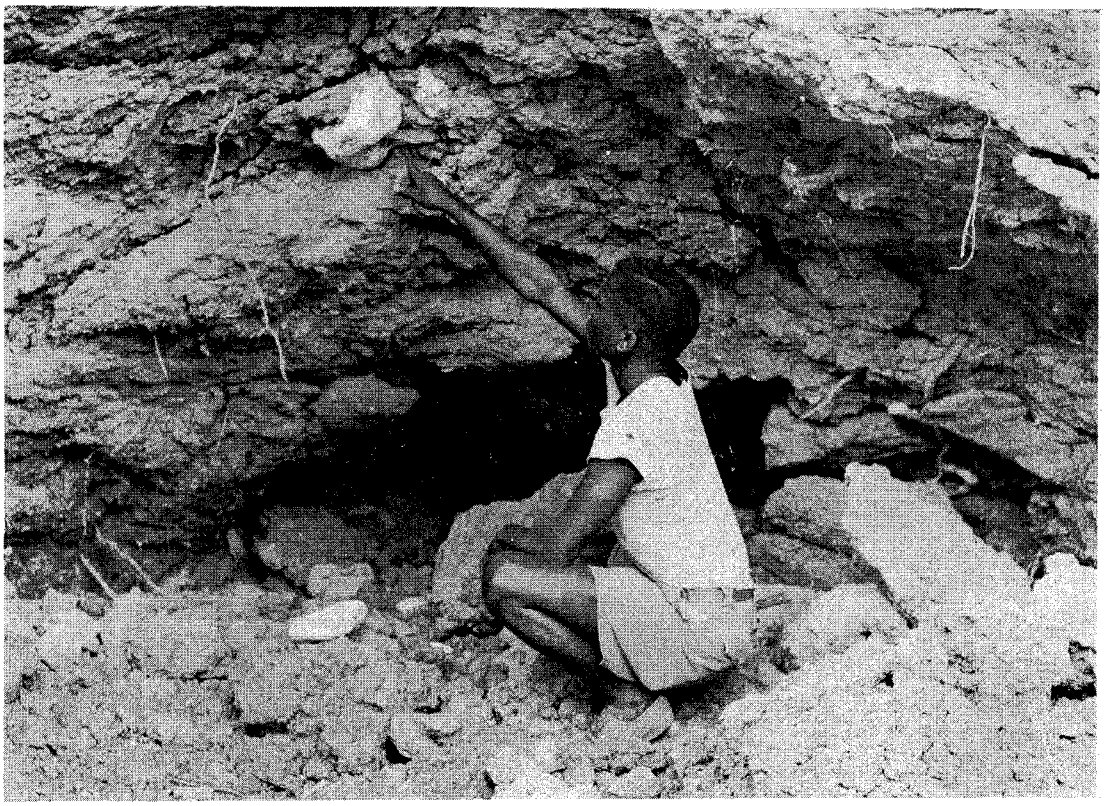
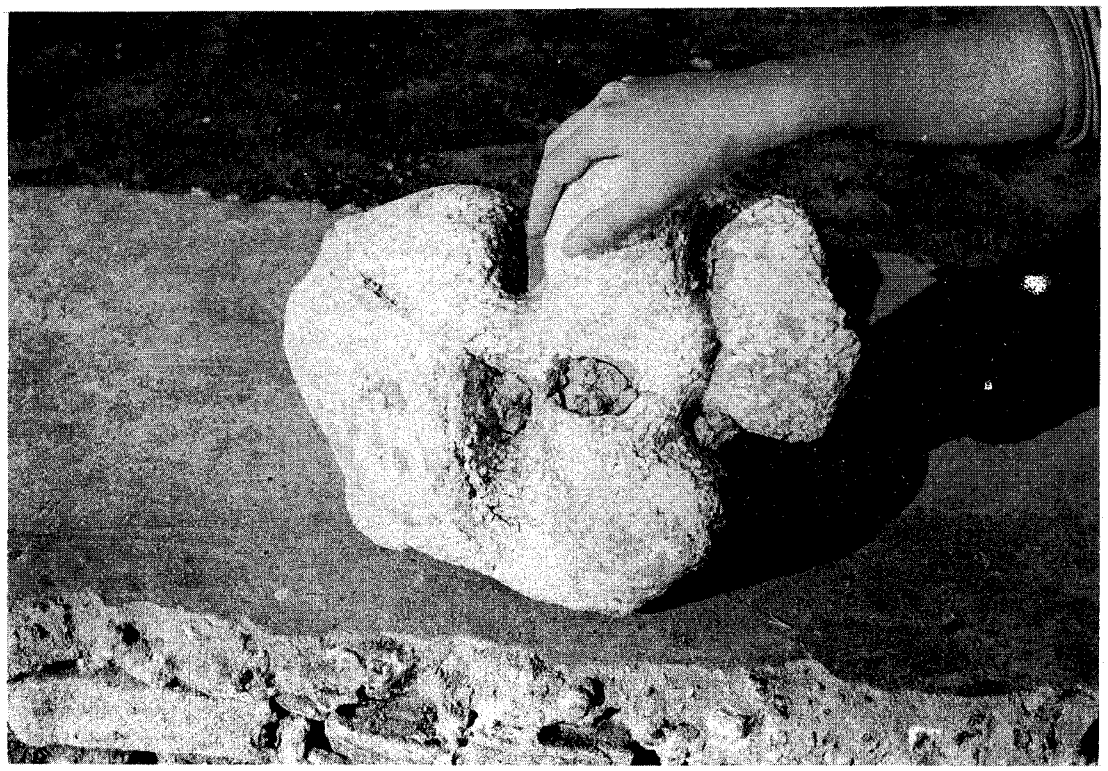
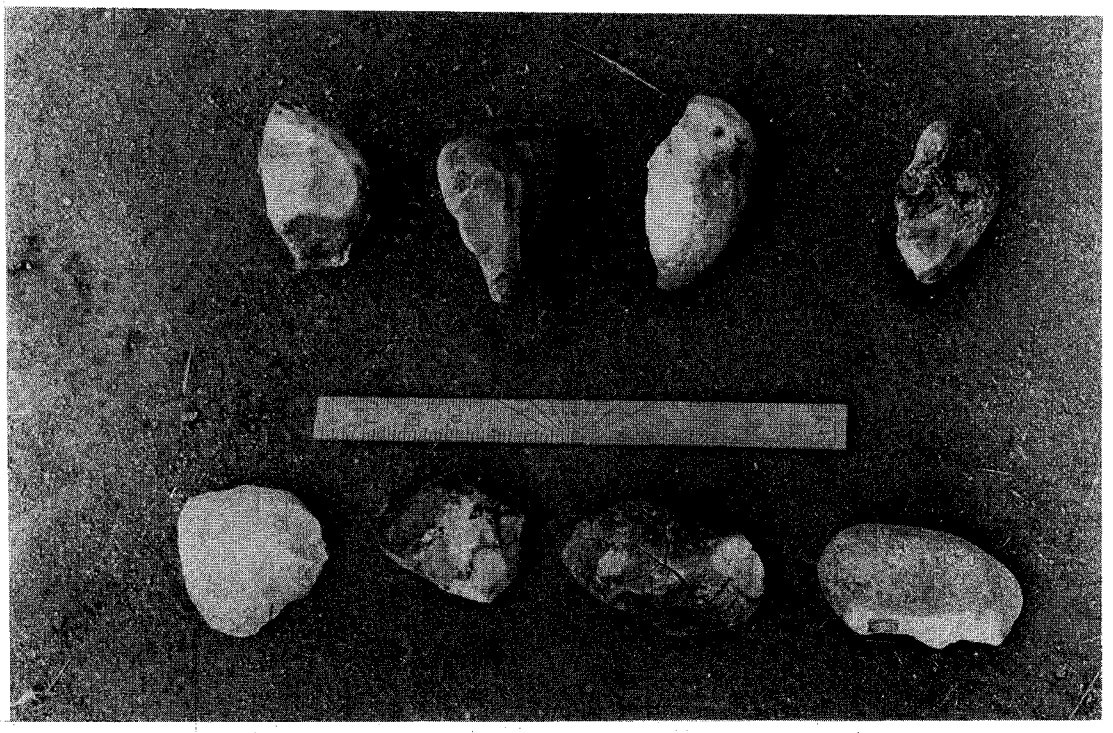


Ancient Flint Mine

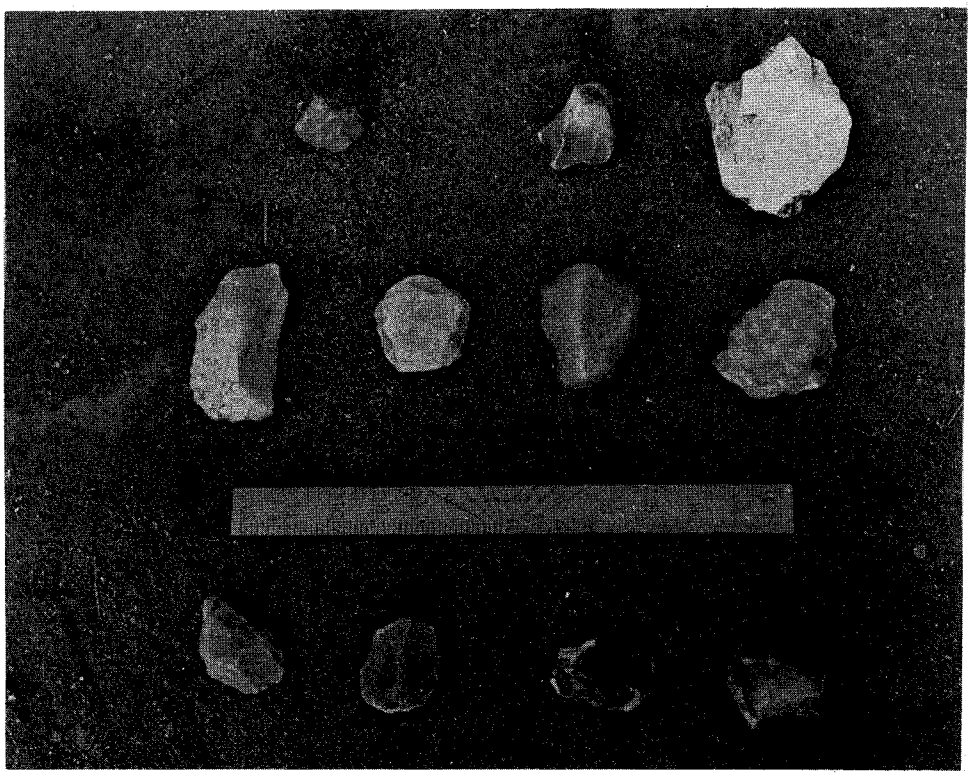


Large Flint Nodule

Gravel Pit with Flint Artifacts

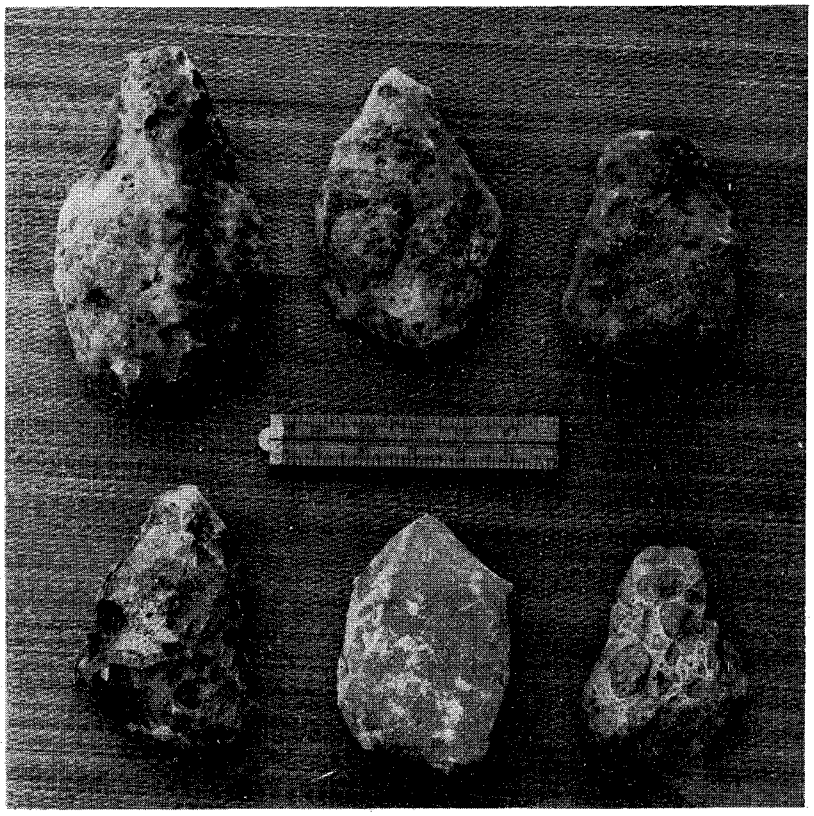


Flint Hand-Axes and Chopping Tools

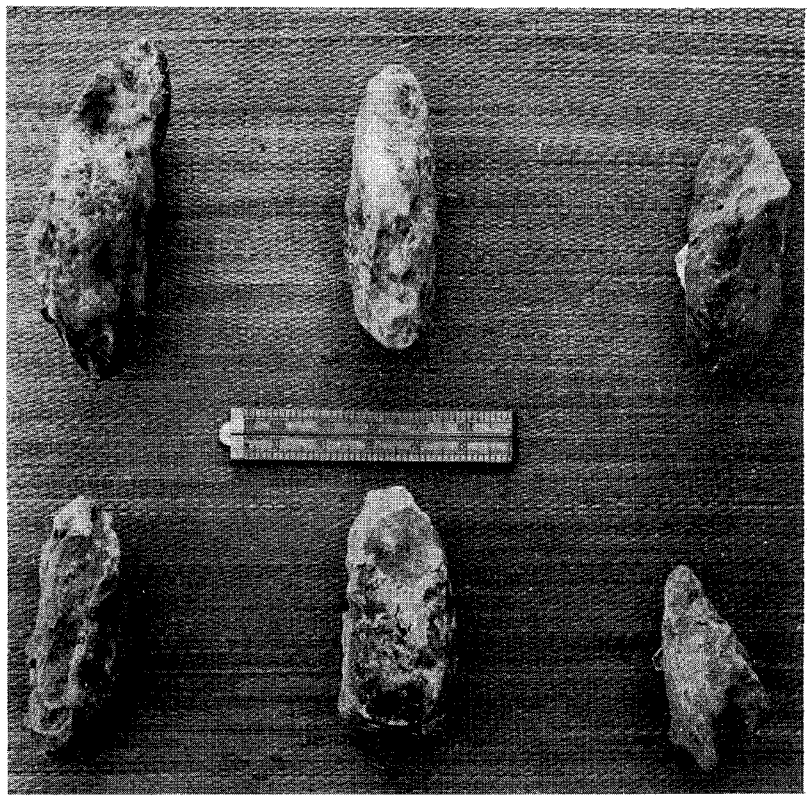


Cores
Large Scrapers
Small Scrapers

Scrapers
Blade Tools
Burins



Eolithic Hand-Axes Lying Flat



Same Implements on Edge