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First Approach to the Ecological and Cultural Significance of the Early Palaeolithic Occupation Site of Garba IV at Melka Kunturé (Ethiopia)

The site of Melka Kunturé was discovered in 1963 by Gérard Dekker, who made the first collections of the Lower Palaeolithic industries located there (1). More abundant material was gathered by Gérard Bailloud in the same year and published for the first time in 1965 (2).

In 1965 a Franco-Ethiopian mission led by Jean Chavaillon began a systematic exploration of the area. Because of its size, the number of sites discovered, part of which have been or are still being excavated, the abundant archaeological and faunal finds made in often intact occupation soils, this area may be considered as one of the most important for the evolution of cultures from the Oldowan to the Late Stone Age in East Africa (3, 4, 5, 6, 7, 8).

Melka Kunturé lies on the Ethiopian plateau about 60 km south of Addis Abeba. The palaeolithic deposits are situated in the sedimentary valley of the Awash River, not far from the present course of the river which, in some cases, has washed part of them away (9).

The distribution of the various sites indicates that about a ten-mile stretch of the Awash Valley was densely populated for more than 1.500.000 years. Research is currently being concentrated on Lower Palaeolithic deposits. Excavation work is being carried out at the site of Gomboré I where an extensive occupation site has been found, which can be attributed to the earliest period of the Melka Kunturé sequence, with an Oldowan industry probably close to that found in the Lower or Middle Bed I of Olduvai (10, 11, 12, 13); Garba IV, with a sequence of five archaeological levels, the most recent of which, Garba IV C and D, currently being explored, may provisionally be compared with the evolved Oldowan assemblages of Olduvai Bed II (14); Simbiro, which has barely been reconnoitred, with a series of levels probably belonging to the Lower Acheulian; Gomboré II in which a more evolved Acheulian assemblage is present, and whence comes the only specimen of human remains found so far in Melka

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Kunturé — a fragment of left parietal assigned to *Homo erectus* (15); Garba I, with an upper Acheulian industry which fills the Acheulian sequence until now explored at Melka Kunturé (10, 16, 17).

The entire Melka Kunturé cultural sequence, made up of 7 distinct periods, has already been outlined by J. Chavaillon (18, 19). The taking of samples for absolute dating purposes was carried out on the tuffs covering the archaeological levels of a few of the sites being excavated, but no results are available to date. For the time being, we thus have no absolute chronological references and the correlations between the various sites have mostly been obtained from examination of the faunal assemblages and the industries, and by comparison of the stratigraphic series of each site, which was often made difficult by the presence of localized erosion phases that upset the stratigraphic sequence even in neighbouring deposits.

The Istituto Italiano di Paleontologia Umana and the Franco-Ethiopian Mission have been collaborating since 1972 for the purpose of excavating and studying one of the prehistoric sites of Melka Kunturé, Garba IV. After the first trial dig carried out by Chavaillon in 1972, excavation work continued on this site in 1973 and 1974 under the direction of one of the present authors (M.P.) and with the constant assistance of numerous members of the French Mission and of representatives of the Ethiopian Archaeological Service (*).

Garba IV is one of the several prehistoric sites of Melka Kunturé discovered along the Awash. It is the closest to the river bank, lying just over 2 m away. Owing to its topographic position a relatively small ravine was sufficient to expose the various archaeological levels and allow the site itself to be discovered.

At the end of 1974 the excavation area covered more than 45 m^2 on the right of this ravine (Fig. 1). The excavation area, roughly rectangular in shape, is bounded by the river Awash to the north, by recent erosion to the west, by the wall of the trench to the south and east. The north and west boundaries of the archaeological deposit have been washed away during flooding of the Awash and by the waters of the ravine. Clearly visible on the left side of the latter is the continuation of one of the levels that have already been explored (D) which will be investigated during future excavation campaigns (Fig. 2).

A short introduction to the site covering the 1972 and 1973 campaigns has been published recently (14). The purpose of the present paper is to give a more detailed description of Garba IV after the 1974 campaign, to make a preliminary survey of the essential aspects of the site as regards its stratigraphy and the organisation of portions of living floor so far exposed and to discuss the general features of the stone industry and the fauna discovered there.

(*) We wish to thank Ato Bekele Negusse, Director of the Archaeological Institute of Addis Abeba and the Ethiopian Minister of Culture. We are most grateful to Mr. Kebbedé Bogalé and Mr. Tafesse G. Egziabher, representatives of the Ethiopian Government, for their active collaboration in the field work. We are deeply indebted to Dr. Jean Chavaillon, Director of Melka Kunturé excavations, for having given to us the chance to work with the French team and particularly to study the site of Garba IV, providing very often helpful suggestions both during field work and the interpretation of the site evidence. A special acknowledgement is due to all the other members of the French Mission for their highly appreciative cooperation.

Excavation method

The excavation method used at Garba IV is the same as that used by Chavaillon for the other Melka Kunturé sites.

The total excavation area is divided up into squares having a side length of 1 m. Once a frequentation level has been located, the unearthed stone and fauna finds are left *in situ* until a sufficiently large portion of the occupation soil, and often the entire surface

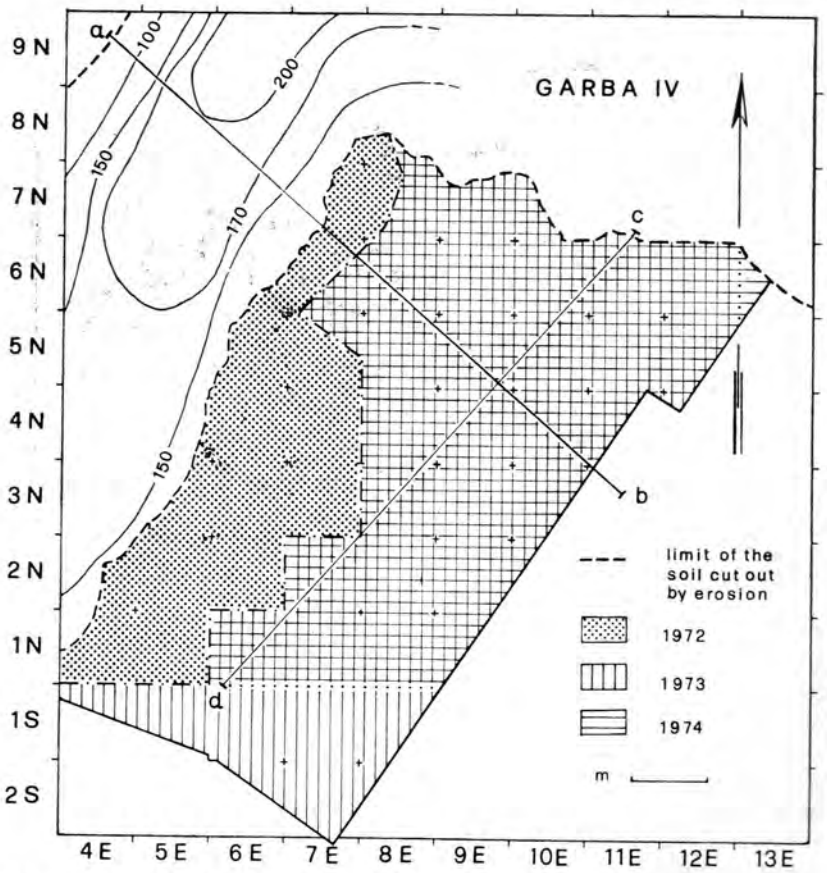

FIG. 1. - Garba IV. Plan of excavations 1972, 1973, 1974 showing grid and contour lines of the ravine cutting the archaeological deposit. (a-b), schematic section NW/SE; (c-d), profile of the surface of the highest level of clay on which rests the soil D. (see fig. 3).

of the excavation area, has been exposed completely. The sediment is seived and the finer fraction washed with a view to finding micro-mammal remains.

A 1:10 scale map is made of the whole of the exposed area, which is also filmed and photographed from different angles, with vertical photographs being taken of every square metre. For relatively poor frequented levels, e.g. Garba IVC, a single map was enough to show the lay-out of the remains. In rich deposits like Garba IVD, which in places reaches a thickness of more than 30 cm, it is necessary to draw up a series of

maps at each of the successive phases of soil removal. Each artifact and bone receives a progressive number and the same number is marked on the map and the field-notes together with the indication of the square of provenance and, in some cases, also its inclination and orientation. Bone fragments too small for palaeontological determination are drawn in plan view and recovered, their square being indicated without a number. The working wasters and small-size flakes are numbered whenever it is possible to expose them without removing them from their original find position. Those recovered by seiving are marked only with their square of provenance. Each piece is then removed and its

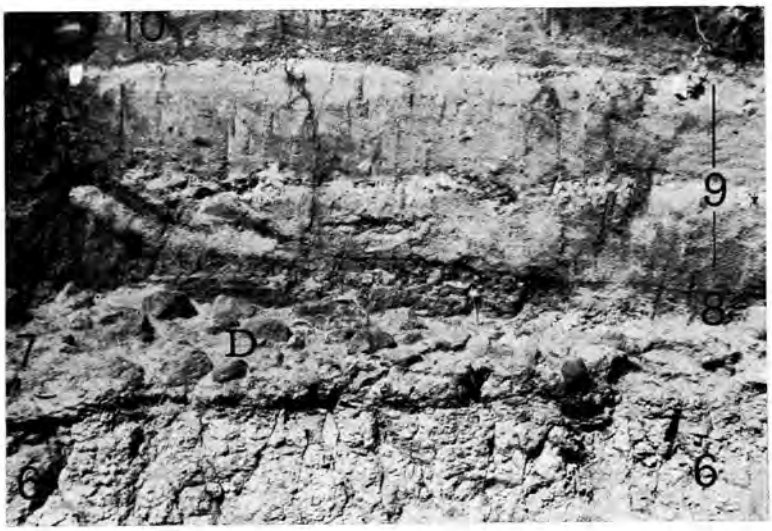

FIG. 2. - Garba IV. Left side of the ravine. It is possible to note in section between the clays and the sands the continuation of soil D still unexcavated. Numbers and letter as in fig. 3.

depth indicated with reference to a point 0 marked on the wall taken starting from the plane of contact of the object on the soil surface. A brief description of the artifact or the fauna find, accompanied by a measurement (maximum length or width) and, in the case of the industry, by an indication of the type of raw material used, is made during the soil removal stage.

Each object is thus marked with the following indications Prog. no. - square - level - description - max. leng./max. width - depth (with respect to point 0) - mater. - remarks (if any) on find-site.

Stratigraphy

All that has been explored so far of the Garba IV sequence are the two upper levels, C and D. The first of these, which was not visible in section at the beginning of work, was discovered by Chavaillon in 1972 and its existence confirmed in 1973 and 1974. The second, much richer one, is still being excavated. The lower levels, E, F, G, have been excavated to a minimum extent with the primary target to recover the few remains exposed by the ravine's erosion.

Until 1974 the Garba IV sequence was divided into 4 main archaeological levels (F, E, D, C) included in formations consisting mainly of clay at the base and becoming more sandy towards the top. Level E had been subdivided into El, consisting of a number of implements and bones visible in section on the right-hand wall of the ravine beneath a clayey formation separating D and E, and E2, consisting of a small number of finds located at a slightly greater depth on the same wall of the ravine.

A more thorough inspection of this sequence, carried out during the taking of stratum samples for pollen analysis in 1974, led to the discovery of the existence of two clearly distinct levels between D and the base level, F. The denomination of the archaeological levels was thus modified as follows:

C = C
D = D
E1 = E
E2 = F
F = G

Briefly, the stratigraphy of the site of Garba IV (Fig. 3) can thus be summed up as follows: level G restes on clay and tuffs which form the base of the sequence as it can be seen today at Garba IV, about 1 m above the level of the present-day river during the period of the excavation campaign (November-December). A small number of objects visible in section attest that the site was first frequented at a time corresponding roughly to Gomboré I.

A rather sandy clay level about 30 cm thick separates layer G from a consolidated ferruginous crust about 5 cm thick on which lie the few artifacts pointing to the existence of layer F. Above this lies a rather consolidated clay layer with included volcanic elements. The latter formation is about 25 cm thick and its covered by a thin layer of tuffs and ashes of a light grey colour, only 6-7 cm thick and rather compact. This is followed by a second, although thinner, ferruginous crust, which can be seen only in a few parts of the section. It is rather irregular and about 3-4 cm thick.

A sondage to follow its direction and its relationship with level E proved that it is slightly inclined towards the East and that the archaeological level E lies slightly above, at the base of the overlying clay formation. The latter is rather homogeneous, contains relatively little sand, is 25 cm thick and concludes the series of older, mostly clayey formations.

The erosion surface of the clay on which layer D rests, is discontinuously covered by mainly sandy fluviatile formations. Layer D is included in a consolidated level of sand and gravel made up of small-size elements (1-2 cm), with frequent small obsidian pebbles. The thickness of this rather variable level reaches a maximum of 25-30 cm. The artifacts and faunal remains representing the occupation soil D overlap over the whole of the above thickness in the northwest zone of the excavation area while in the east and south zones they are less concentrated and arranged in a single plane only a few cm thick.

A formation of sand with clay pebbles at the base covers deposit D. At the same depth as the clay pebbles, scattered artifacts and fauna remains attest to

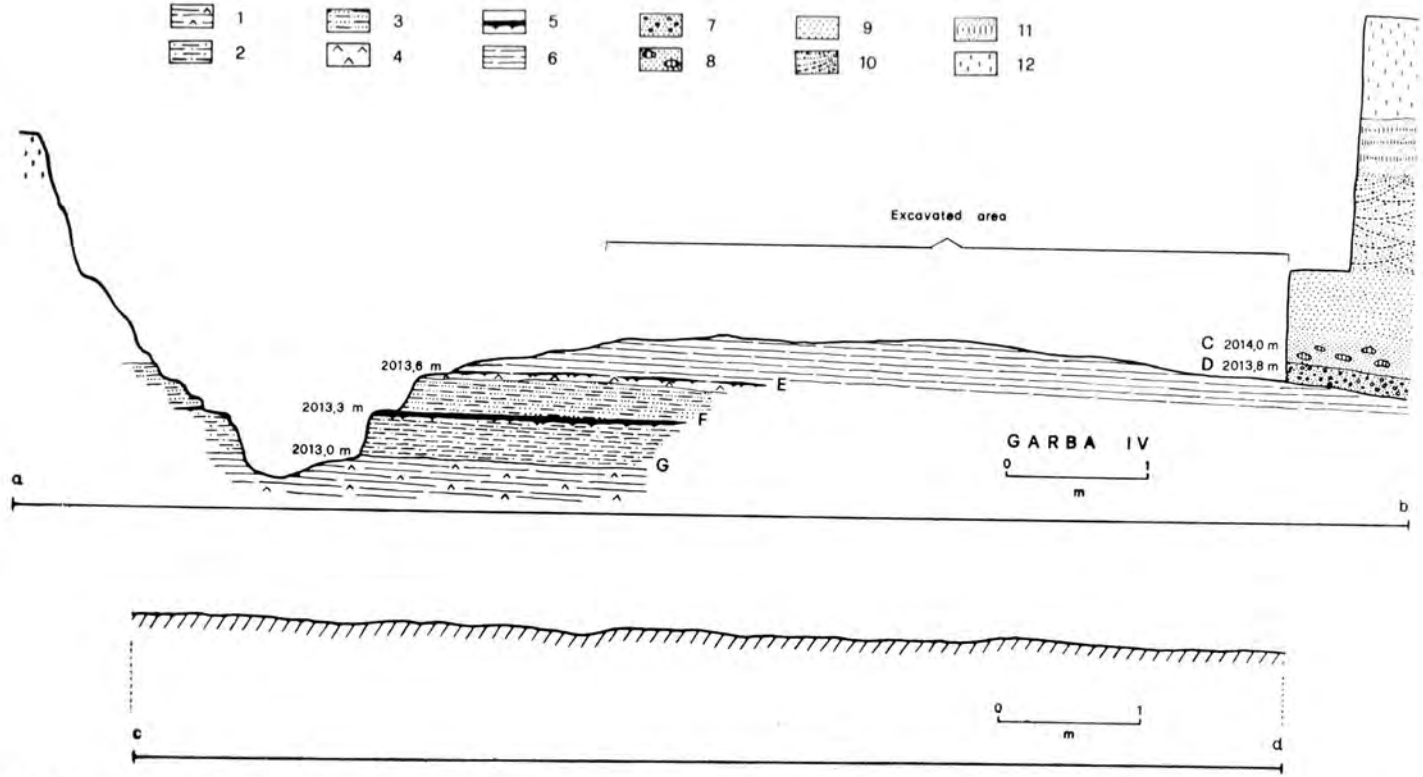

FIG. 3. - Garba IV. Top: schematic section of the site: 1 = tuffaceous clay; 2 = sandy clay; 3 = consolidated sandy clay; 4 = ash and tuff; 5 = ferruginous crust; 6 = clay; 7 = sand with fine gravel; 8 = sand with clay nodules; 9 = fine sand; 10 = cro-bedded sand; 11 = sand with lenses of clay; 12 = vertisol. Bottom. Profile of the surface of the level of clay underlying soil D.

the presence of layer C. The finer elements composing the lower portion of the sand formation gradually give way to heavier elements including obsidian pebbles. Above this are interstratified sands covered by a final deposit of sand intercalated with thin horizontal lentils of tuffaceous clay (B). The entire sequence is overlain by a vertisol layer (A) containing disturbed Acheulian industries and Late Stone Age artifacts.

Level C

Included as they are in the first sand level with clay pebbles covering soil D, the objects assigned to level C are found scattered all over the area excavated on the right of the ravine with an apparent tendency to be concentrated on the southeast boundary of the excavation area (Figs. 4, 5). Owing to the difficulty

Fig. 4. - Garba IV. Portion of soil C during excavation 1972; note at the bottom a portion of soil D in section, still unexposed.

of establishing precisely the boundary between the base of C and the upper part of the underlying deposit D, especially near the east wall, in 1973, a number of artifacts and fauna remains found in squares 8-9-10 East/1-2-3-4 North were provisionally assigned to D, also on the basis of their depth with respect to point O. During the 1974 campaign, it was in the vicinity of the east wall that

the sand level enclosing C was observed to slope gently towards the East and that actual contact between C and D in this zone takes place at a greater depth, although only by a few cm, than in the central area of the excavation. As a result, the hundred or so objects originally assigned to D have been definitively included in layer C above.

In spite of these insertions, an examination of the distribution of the stone tool and faunal remains from C, whose excavation on the right-hand side of the

FIG. 5. - Garba IV. Detail of soil C: one hippopotamus canine-tooth and some tools are lying isolated at the middle of an area lacking of other remains.

ravine was completed in 1974, seems to indicate the absence of any significant concentrations. Throughout the entire thickness (10-20 cm) of the sand deposit, the remains are found to vary somewhat in their relative depths except in some squares near the southeast wall, where a more regular horizontal distribution can be seen and followed which seems to continue beyond the boundaries of the excavated area.

If the objects unearthed correspond to an actual organised occupation level, the zone of most intense frequentation ought to lie to the immediate south-east of the excavation boundary. The area exposed would thus, in this case, seem to form the outer edge of the occupation soil, as would appear from the gradual rarefaction of artifacts in the central areas of the sector explored.

A second hypothesis may be advanced concerning the type of frequentation occurring at Garba IVC. The overall low frequency of industry, fauna and

unworked pebbles could point to an occasional, short-lived stay without implying the presence of permanent occupation structures.

In any case, several considerations can be made: all the objects are found in their original position and must have thus undergone only a slight degree of transportation. This can be deduced both from the physical condition of the artifacts, which show no appreciable traces of rolling and from the presence of split pebbles and flakes that can be linked up with cores or parts of pebbles usually lying not more than one metre away. The last feature shows that during the stay at this site, however short it may have been, a number of implements were cut, utilized and later abandoned. The frequency of corresponding implements, cores and flakes can, in some cases, be indicative of the duration of the occupation of a living site. A survey of this kind has still to be carried out for Garba IV. The presence of implements throughout the thickness of layer C in any case points to the probable existence of a dislocation of the pieces in a vertical direction. This phenomenon is relatively easy to understand if it is remembered that a few of the artifacts originally left on the surface of the beach may quite easily have been buried under the beach surface already at the time the site was frequented, as a mere result of human activity.

Apart from the absence of all significant concentrations of remains, what distinguishes level C from D is an obviously lower frequency of unutilized materials introduced into the deposit. Unworked river pebbles are rare at Garba IVC and their presence does not correlate with any particular organisation of the occupation level, as is true, on the contrary, in the case of Garba IVD. Also absent, at least in the area excavated so far, are the large blocks of lava or basalt that, as we shall see, form a peculiar feature of Garba IVD.

The relatively small number of pebbles has had an effect on the composition of the Garba IVC industry, in which the flake implements are much more numerous than those of pebbles.

Only in an area restricted to squares 9-10 East/2-3 North, do the flakes and the pebble tools lay-out seem to correlate closely with the comparatively large numbers of faunal remains. This is also the only level C zone in which, besides a number of rather fragmentary bone remains, it is also possible to find a few whole bones of large animals (hippopotamus and bovids).

A second, although less conspicuous, concentration is found slightly further north, in squares 10-11 East/4-5 North, where a few bone fragments — one hippopotamus incisor, an antelope horn and hemi-mandibula lie side by side with a small number of artifacts.

In the central and northern part of the excavated area (6-7-8 East/2-3-4 North), bones are extremely rare and fragmentary or, in a few squares, practically absent. The same degree of rarefaction affects also the industry. Only along the western edge of the ravine near the south wall, is there a small quantity of unutilized pebbles and industry, whereas the faunal remains are rather rare also here. In squares 6-7 East/1 South and 6 East/2 South, there are about 40 unutilized river pebbles which, in this relatively small area, make up the largest concentration in the whole of level C.

No exhaustive typological analysis has yet been attempted for level C and

the characteristics that can be assigned to the assemblage have so far been derived from preliminary observations carried out during the excavation campaign.

In a previous paper (14) a few results concerning the composition of the stone assemblage and the utilization of the various raw materials were given. Even though the provisional data published have obviously had to be modified in the

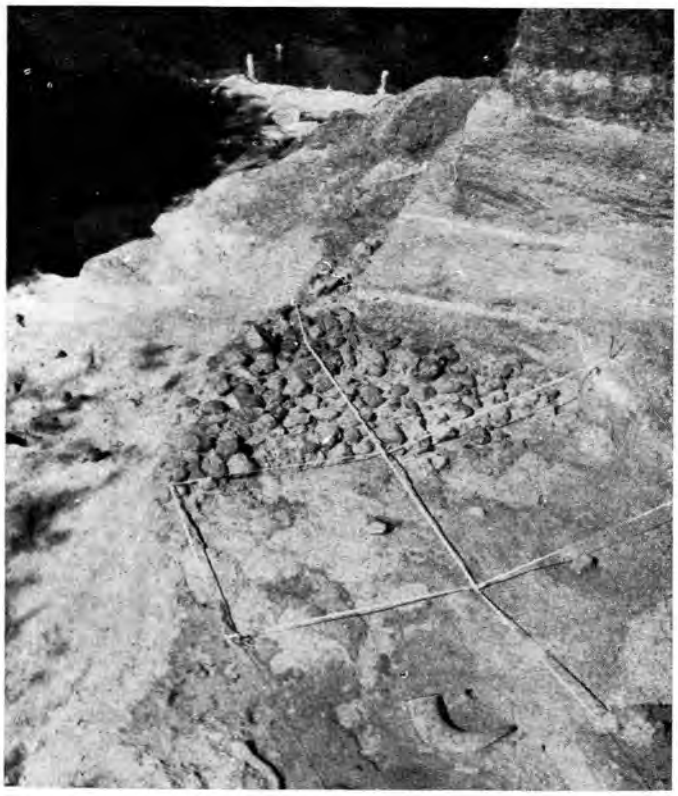

FIG. 6. - Garba IV. View from south of a portion of soil D excavated in 1972. Note the sudden interruption of archaeological remains towards the northern limit of excavation.

light of the 1974 excavation, the general picture emerging from the first observations remains basically the same. The Garba IVC industry is mainly on flakes with a small percentage of pebble tools. Only a small proportion of the flakes have been retouched while a larger number show traces of usage.

As regards the raw material used, preference is given to obsidian for flake tools and to basalt for pebble tools.

The flakes vary in size from small to medium (3-6 cm), and the pebble tools from about 9-12 cm. In addition to the fauna already published, i.e. mainly bovids, hippopotamus and equids, there is also the crocodile, a tooth of which was found in 1974.

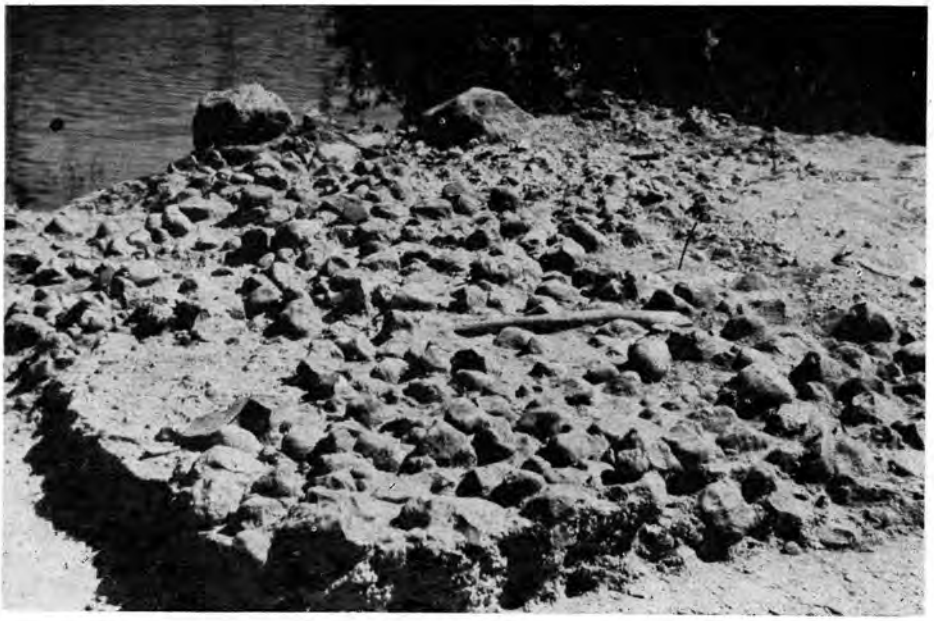

FIG. 7. - Garba IV. View from West of the area of greater concentration of tools and bones on soil D (Excavation 1973).

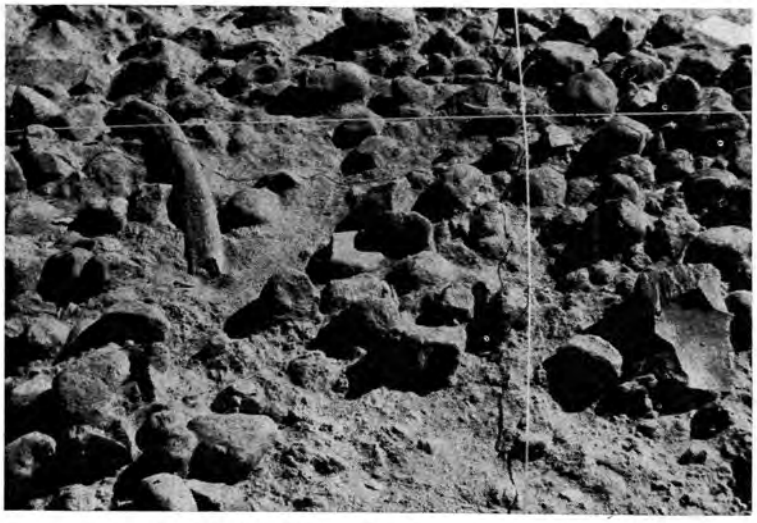

FIG. 8. - Garba IV. Detail of the surface of Soil D.

In spite of the peculiar features characterising Garba IVC, due mainly to the type of occupation of the site and probably also to its short duration, the frequentation of Garba IVC seems to have taken place at a time that was not too far removed from that of the underlying layer D.

Also a preliminary analysis reveals no faunal or typological features suggesting any differentiation between the two assemblages which must thus be considered to reflect the fact that the site was frequented with only relatively short intervals of abandonment by a group of hominids possessing an identical, well-defined cultural heritage.

The more detailed description of a number of level D artifacts may thus be useful to exemplify the technical and typological characteristics of the Garba IV industry as regards also the level C assemblage.

Level D

The coarse fluviatile sand mixed with fine gravel (1-2 cm in size), which cover discontinuously the mainly clayey lower formations, enclose the archaeological deposit D over the entire area so far excavated.

Unlike archaeological level C which seems to extend solely towards the southeast, beyond the boundary of the excavation area, level D, which has been cut into and partly removed by the ravine about 8 m long and 2 m wide, running south-north, extends to the left of the ravine itself where it can be seen in section.

Fig. 9. - Garba IV. Vertical view of the northern area of soil D (excavation 1974); in the empty areas bones and tools have already been removed.

The position of the two occupation soils thus does not seem to be exactly superimposed, as layer D extends mainly westwards with respect to the recent cut and layer C more to the East. It is conceivable that, at the time of the occupation of level C, it was still possible to see a few vestiges of the preceding occupation soil (particularly a few large blocks projecting beyond the surface of D) that had not yet been completely covered by the first alluvial sands forming the base of C. What

is certain is that in the places corresponding to the zones of maximum concentration of soil D, the remains belonging to layer C above become less frequent and actually disappear as you approach the north-west boundary of the excavation area.

Of the more than 45 square metres of excavated area, about 37 are thickly strewn with unutilized river pebbles, pebble tools, flakes and bones, often lying close together, on top of one another, and occasionally forming concentrations, particularly in the north-west sectors of the excavation, of up to 30 cm thick (Figs. 6-10).

FIG. 10. - Garba IV. Detail of soil D viewed from South-West. Note two of the huge blocks caracterising soil D and the considerable thickness of the same soil, caused, in the area of main concentration, by the superimposition of tools and bones.

The floodwaters of the Awash have eroded the deposit, causing the destruction of the northern boundary of the soil D. Towards the East, however, it is possible to see the original edge of the soil which comes to an end just before the trench wall and is marked by the rather abrupt termination of the pebble bed beyond which there is a dispersion strip just over 1 m wide with occasional unutilized pebbles and rather sporadic flakes and fauna remains.

The southern boundary of layer D ought to lie in the portion of deposit whose excavation has still to be completed, and then to peter out just beyond the south wall of the trench.

The unutilized river pebbles are more highly scattered in this area, the soil is strewn with numerous flakes, mostly of obsidian, with a comparatively small number of pebble tools and large fauna remains, including numerous bovid horns, scapulas and large fragments of a hippopotamus' pelvis (Fig. 11).

The northern zone with its heavy concentration of river pebbles, tools and

fauna remains, surrounds on three sides a small, irregularly-shaped inner area corresponding to squares 6-7 East/4 North and to part of 6-7 East/3 North and 8 East/4 North, which covers an area of less than 3 square metres and is completely sterile. The termination of the pebble layer on the edge of this zone is

FIG. 11. - Garba IV. Central area of soil D (excavation 1972), viewed from North, corresponding to the zone of highest dispersion of remains.

so abrupt as to make it likely that an obstacle once prevented this zone from being frequented. This obstacle may been made of perishable material such as skins or branches deliberately introduced on to the site by man and placed for some reason in the area in question, or even consisted of a natural barrier due, for instance, to the presence of bushes.

One typical feature of the soil of Garba IVD is the presence of a few large blocks of basalt intentionally brought to the site, whose significance still remains to be explained. Four of these blocks are located inside the portion of fossil deposit having the highest concentration of objects near the north edge of the excavation (Fig. 12). Three of the latter lie in squares 9-10 East/6-7 North and are no more than 1 m apart. The remaining block, the largest of the four, is situated on its own towards the northeast boundary of the fossil deposit. The fifth was discovered during the 1974 campaign by following, the continuation of layer D visible to the left of the recent erosion, and its position seems to be possibly connected with the southwest boundary of the occupation level (Fig. 13).

Besides their large size (the biggest is 43 cm wide, 37 cm long and more than 40 cm high, the others slightly smaller), it seems significant that four out of the five blocks are partly surrounded by large fauna remains (e.g. ribs,

fragments of pelvis and mandibles belonging to hippopotamus, fragments of bovides skull and numerous antelope horns).

In all four cases, these remains in close proximity to the blocks are arranged along the edges of the block facing the central area of the occupation soil.

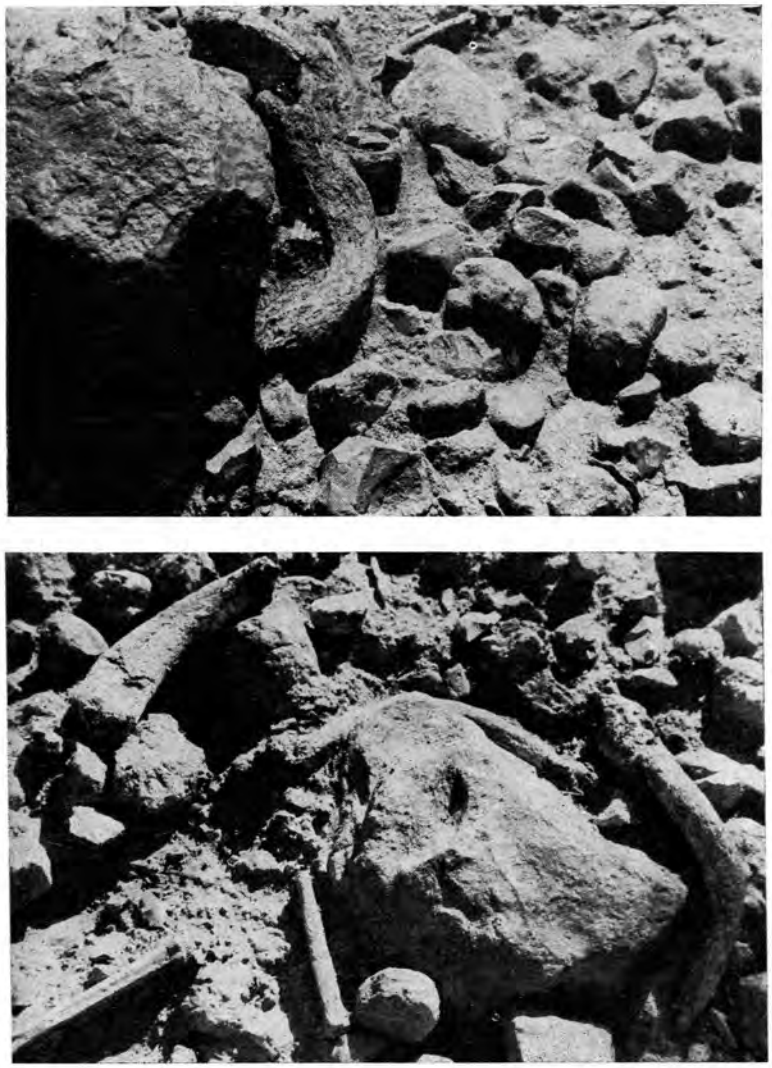

FIG. 12. - Garba IV. Detail of two of the huge blocks surrounded by faunal remains in the northern zone of excavated area.

The meaning of this layout of the remains, by no means accidental, will, however, be difficult to understand until also the portion of soil to the left of the ravine has been explored and the general shape of this living floor thus clarified.

In the case of the four blocks found lying along the northern edge of the

excavation, it must be pointed out that this boundary is an arbitrary one and duc only to the erosion caused by the Awash. Nor can it be established with any accuracy how much of soil D has been destroyed by the river waters and what the original natural boundary of the occupation deposit was in this zone.

However, it is possible that the peculiar layout of bones and blocks is connected with the presence of some kind of structure (hut or similar shelter of branches) marking some limits of the living floor of Garba IVD.

Even the presence of numerous inutilised fluviatile basalt or lava pebbles lacks until now of a clear interpretation.

These pebbles can be considered « manuports » in the sense meant by M. D. Leakey (20) and are scattered over the entire excavated area, particularly in the

FIG. 13. - Garba IV. Huge block surrounded by bones, belonging to soil D, visible in section on the left side of the recent erosion.

northern zone, without any apparent meaningful concentration. They will probably reflect the traits with greater frequentation in the site or the presumed central area, should the presence of a structure be confirmed at the end of the excavation work by analysis of the distribution of stone and bones or by other evidence.

It may be observed immediately, however, that these pebbles do not lie only at the base of layer D but are found together with the other remains throughout the entire thickness of the occupation level. This suggests that they are not to be interpreted as the result of the preparation or modification of the site at the beginnigg of the settlement (e.g. the numerous artificial layering known from other sites that appear as some sort of « paving », probably for the purpose of drainage of the inner area of the dwelling structure) but are rather the result of a slow continual transport by man during the entire period of his occupation of the site.

The hypothesis that the pebbles were brought to the site as a reserve of raw

material does not seem to be borne out by the frequency of flakes or working rejects of basalt or lava so far found at Garba IVD.

Unlike the obsidian tools and flakes, most of which were certainly cut on the site itself, the ratio between implements on pebbles and basalt or lava flakes clearly shows that most of the former were made outside the occupation area. The basalt and lava flakes are relatively uncommon and working wasters of the same materials are rare (21).

Also the possibility that we are dealing with a natural pebble beach frequented by man does not seem to be acceptable. Preliminary analysis of maps of the site of Garba IVD shows that, if all artifacts and fauna remains are eliminated, leaving only the unutilized pebbles, the distribution of the latter does not appear to be regular and uniform as it would be in a stretch of beach but appears with large empty areas alternating with more highly concentrated sectors. In the latter, also in the central south zone of deposit D the pebbles themselves are constantly present in the zones where fauna remains and industry are more plentiful, and are absent where artifacts are less frequent or rare.

The artificial introduction of these pebbles into the site by man may explain the presence of a few highly rolled pebble tools among the Garba IVD industry.

The physical condition of all the obsidian artifacts and most of the basalt and lava implements is quite fresh and the pieces all display fine cutting edges except for the natural alterations undergone by the different types of stone. In general, it may be stated that both the stone and the faunal remains are *in situ* or have occasionally been displaced by a few cms before the whole deposit was completely covered by the sand of level C.

In a few rare cases, however, the alterations undergone by a few tools on lava or basalt pebbles are so extensive that the flake scars have been almost cancelled out completely and the edges are badly eroded. These pieces, which have undergone obvious rolling, are often found in direct contact with other, quite fresh artifacts. This is the case, for instance, of a highly rolled chopper found in 8 East/5 North together with obsidian flakes and other pebble tools showing no signs of rolling.

As it can be excluded that the small number of rolled artifacts of Garba IVD underwent this alteration after being introduced into the site, it is quite conceivable that the pieces were accidentally gathered together with other, unutilized pebbles and that at the time of the frequentation of Garba IVD they had already undergone this degree of rolling.

Analysis of the horizontal distribution of the various categories of artifacts, of the various types of raw material used and of the fauna remains has yet to be completed so it is not possible to know how the Garba IVD site was organised.

From examination of the maps and observations made during the 1974 campaign, it is possible to obtain a few preliminary indications:

a) *General distribution of faunal remains*

Even though bones, teeth and horns are found throughout the area of the occupation deposit, with the sole exception of the central sterile zone mentioned earlier, there is clearly a definite concentration in the northern zone where it is

possible to make out an extensive strip running through squares 5-6 N/6-10 E up to the block in 7 N/9-10 E in which the fauna remains are thickly concentrated. This concentration comes to an abrupt end towards the South near the edge of the sterile central area, while towards the North it terminates (as a result of cutting by the Awash) near the block in 7 N/9-10 E.

Along the strip, the bones are particularly frequent in squares 5-6 N/8 E and delimit an area of intense frequentation round the large stone in 6 N/9 E. Rather fragmentary and scattered fauna remains surround the boundary of the

FIG. 14. - Garba IV. Detail of soil D. Numerous obsidian flakes, a basalt chopper and an obsidian unutilised pebble are visible.

sterile area to the East, reaching a comparatively high concentration near the southeast edge of the same area, particularly in square 3 N/7 E.

The south sector of the Garba IVD soil so far exposed is, on the contrary, characterized by the presence of a fairly large number of intact remains, mostly large bones (scapulae, pelvis and teeth of hippopotamus and horns of large bovids and antelopes scattered over a high dispersion area with relatively small numbers of other fragmentary bone remains.

In the case of an open site like Garba IVD, an examination of the horizontal distribution of fauna remains is obviously indicative not only of the existence of preferential frequentation zones and of the possible approximate duration of the occupation of the site itself, but also of the manner and speed of burial of the living floor itself after its abandonment by man.

Recent studies by C. K. Brain (22) and G. L. Isaac (23, 24) have shown how the destruction and dispersion by predatory animals of the bone remains in an open site which occurs shortly after the site has been abandoned is a particularly

frequent phenomenon and so intense as to falsify considerably the interpretation of the fauna assemblages found during the excavation work.

However, when, as at Garba IVD, these remains are characterized by a concentration and, above all, by a particularly indicative horizontal layout not too unlike the one existing when the site was abandoned, it may be said that:

(a) the deposit was covered slowly as a result of some event, flood, volcanic eruption, etc. taking place in such a way as not to disturb the original position of the remains;

(b) the period of time elapsing between the abandonment of the site and its burial must have been too short to allow too much displacement of the bones by predatory animals.

b) *General distribution of lithic remains*

At the present stage, it is more difficult to ascertain the existence of any definite pattern of stone industry distribution.

There are no indications of significant distributions of basalt or lava tools apart from a greater frequency of pebble tools in the northeast sector.

Of greater interest even at this early stage is the distribution of obsidian

FIG. 15. - Garba IV. Detail of soil D. To the right a basalt cleaver around which lie numerous small obsidian and basalt flakes.

artifacts. The utilization of this raw material was quite extensive at Garba IVD and the quantity of utilized or retouched flakes, or of simple flaking chips, the presence of numerous cores and wasters, go to make up one of the most obvious features of the industry of this site (Figs. 14, 15).

Although obsidian artifacts are very common throughout the excavation area,

at least two relatively small sectors exist in squares 7 East/5-6 North and 9 East/5 North, where numerous flakes, wasters and cores are found in close association.

A preliminary subdivision of the finds from these two sectors, made on the basis of the characteristics of the different types of cortex on the primary flakes and cores, shows that these artifacts may be placed in a number of groups so as to demonstrate that they come from the same pebble or block of obsidian. This suggests that in both of these sectors a rather intense stone-working activity was carried on and that we are dealing with two small « ateliers » well-defined within the most intensely frequented area.

FIG. 16. - Garba IV. Antelopes' horns from soil D; 1, 3: frontal view; 2: lateral view. (Scale in cm).

THE FAUNA

The state of preservation of the fauna remains is not good and, in the main, most of the bones are rather fragmentary. In spite of this the Garba IVD fauna is particularly interesting for the number of different animals represented and the abundance of the remains, rather unusual in such an old site; this is further evidence of the long frequentation of the site.

The most commonly hunted bovid is the antelope, represented here by numerous horns, jaws (Figs. 16, 17, *1-2*), isolated teeth and long, almost always fragmentary bones.

In agreement with the first pollen analyses made by R. Bonnefille (25), the abundance of the antelope points to the existence of an open territory of graminaceous savannah with rare tree species, but may also reflect a special preference for hunting this type of animal. It is also significant that the presence of numerous horns in the occupation deposit may be explained, at least in some cases, by a probable utilization of this material. A further two bovid types, one the size of a

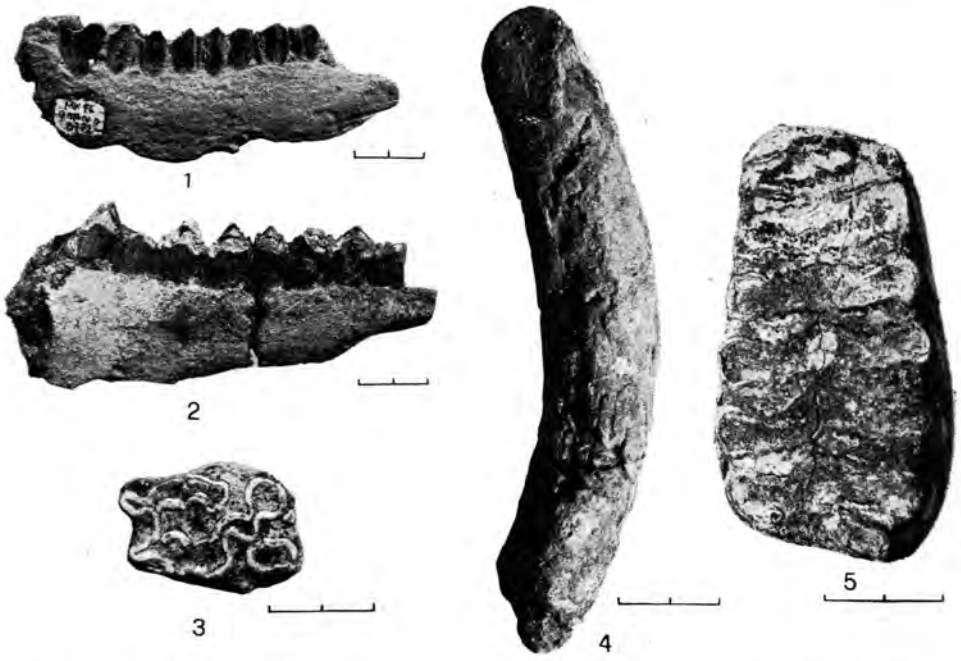

Fig. 17. - Garba IV. 1, 2: fragmentary mandibles of antelopes; 3: phacocerous molar; 4: superior incisor of hippopotamus; 5: molar of elephant. (Scale in cm).

buffalo and the other smaller, a kind of gazelle, are also present at Garba IVD but less frequent.

The hippopotamus (*Hippopotamus gorgops*) is also well represented by numerous remains of scapulae, pelvis, vertebrae or by fragments of long bones, but above all by a large number of teeth (Fig. 17, *4*). In many cases the latter include flakes removed deliberately from incisors and canines.

Among the pachyderms, the elephant is very rare at Melka Kunturé. Its presence in archaeological levels was not detected until 1974 when a small molar was found in square 10 East/6 North at Garba IVD, in the sector representing the area of maximum concentration of palaeontological remains in the entire occupation soil (Fig. 17, *5*).

Two kinds of equids, a large one and a smaller one, are present at Garba IVD. Their specific determination has not yet been carried out (except for one of the two identified as *Stylohipparion*. Equids are represented by numerous teeth and

occasional long bones. The most interesting specimen is a mandibular symphysis found in square 7 East/1 North in an excellent state of preservation (Fig. 18).

The suids are comparatively rare and so far represented exclusively by a few teeth (Fig. 17, *3*). On the base of a determination of one of these, found in 1972,

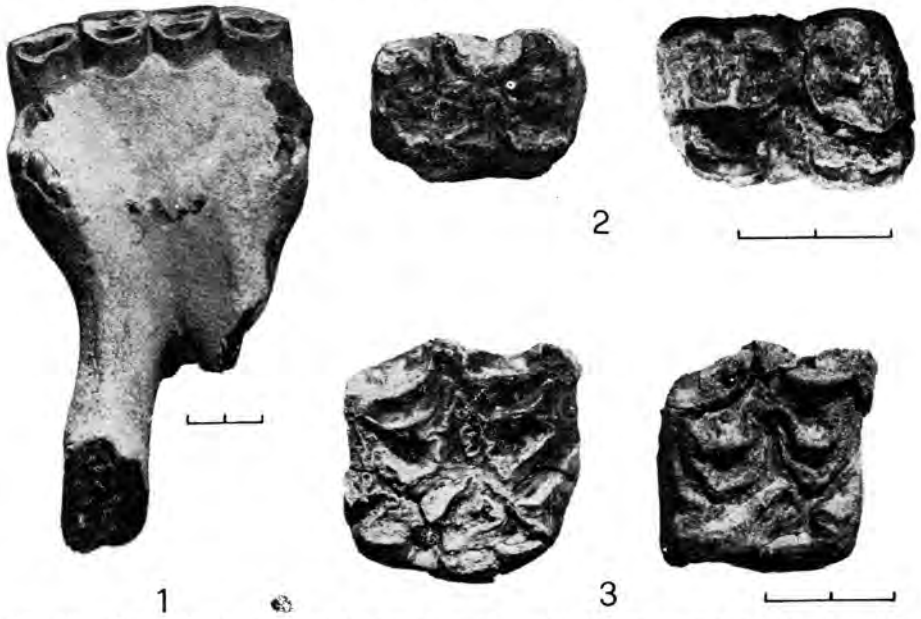

FIG. 18. - Garba IV. 1: mandibular symphisis of equid; 2: inferior molar-teeth of equids; 3: superior molar-teeth of equids. (Scale in cm).

H. B. S. Cooke proposed an approximate possible age for Garba IVD between 1.200.000 and 700.000 years (*).

Rarer still is the crocodile, the only traces of which found in the site are a few teeth and a probable fragment of plate; carnivores, of which only a few very rare fragments exist; and rodents, represented by a single tooth of a large porcupine.

GARBA IVD INDUSTRY

The initial general impressions reported after the 1972-1973 excavations (14) were confirmed at the end of the 1974 campaign.

More than 2700 artifacts have been found in the portion of the Garba IVD deposit explored so far. To be added to them are the large numbers of working wasters, usually less than two cm long, not plotted on the maps or found during seiving. They amount to several hundreds. The average density of the artifacts

(*) Personal communication.

1) Straight simple side-scraper with transverse denticulate on an obsidian flake. The right edge shows utilisation. Plain platform. Fresh. 36 x 40 x 20 mm (1453, 8E/3N).
2) Convex transverse side-scraper on an obsidian flake with small portion of cortex preserved. The extensive step-flaking retouch creates a very abrupt front, quite carenated; on the right edge are visible limited traces of retouching. Striking platform is punctiform. Fresh. 28 x 36 x 17 mm (7087, 9E/4N).
3) Convex transverse side-scraper on an obsidian flake, with partially preserved cortex.

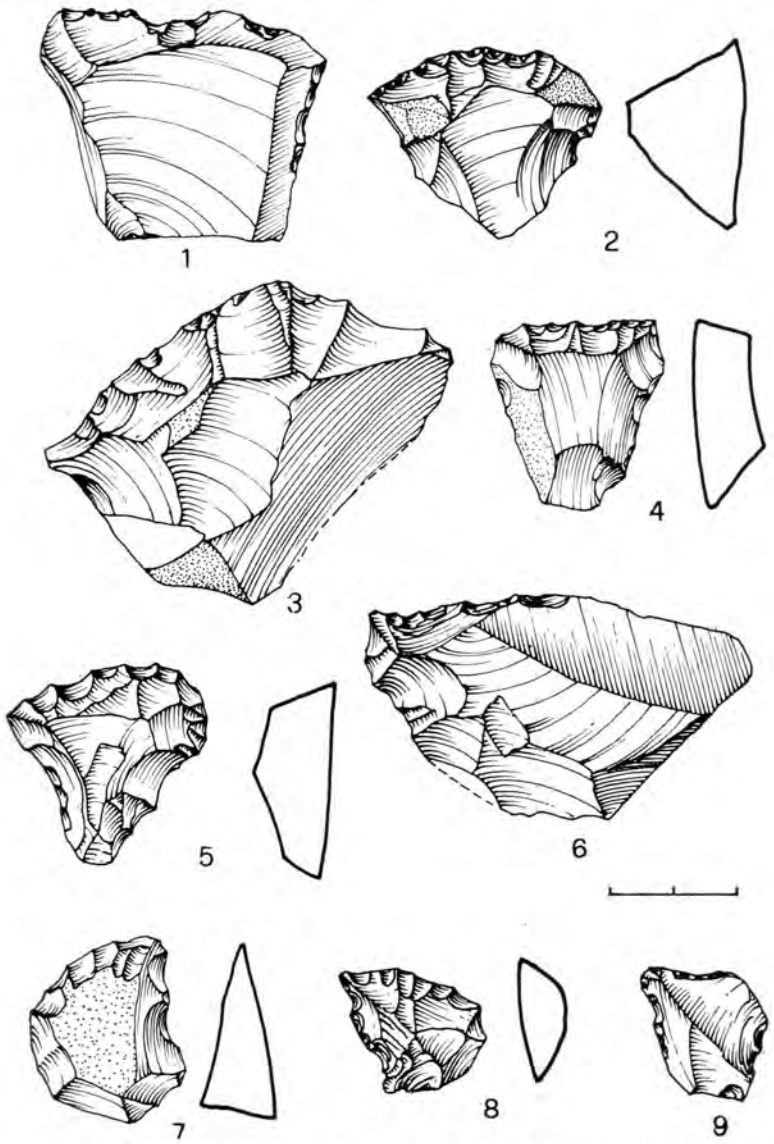

FIG. 19. - Lithic industry from soil D of Garba IV.

The retouch is step-flaking, sub-parallel and slightly denticulated; the left edge shows utilisation. The platform is wide and plain. Fresh. 60 x 43 x 22 mm (6630, 9E/6N).
4) Stright transverse side-scraper on an obsidian flake with small portion of cortex preserved; the transversal retouch is abrupt; the right edge slightly denticulated. Plain platform. Fresh. 29 x 27 x 15 mm (6583, 3E/4N).
5) *Déjeté* side-scraper on an obsidian flake; the slightly denticulated retouch becomes parallel between the transversal and the right edge. Fresh. 30 x 32 x 13 mm (7464, 9E/6N).
6) *Déjeté* side-scraper on an obsidian flake. The retouch is partial on the transversal edge, more extensive and denticulated on the right one. Platform not visible. Fresh. 49 x 45 x 28 mm (6915, 8E/5-6N).
7) *Déjeté* side-scraper on an obsidian flake with wide portion of cortex preserved. The retouch is slightly denticulated. Platform not visible. Fresh. 29 x 26 x 11 mm (6594, 8E/4N).
8) *Déjeté* side-scraper on a small obsidian flake. A little borer is formed at the intersection of the transversal and left edge. Plain platform. Fresh. 19 x 25 x 8 mm (6593, 8E/4N).
9) *Déjeté* side-scraper on a small obsidian flake; abrupt retouch; the proximal end of the left edge shows utilisation. Plain platform. Slightly abraded. 23 x 19 x 7 mm (1412, 8E/4N).

calculated for the whole excavation area comes to about 100 pieces per square metre.

The vast majority consist of non-utilized flakes, followed by a good number of flakes with traces of usage and by a comparatively small number of retouched implements. Artifacts on pebbles account for less than one third of the total number of flake tools.

The following indications and figures are still only approximate but are nevertheless reported in order to give a first impression of the frequency of the Garba IVD artifacts and of their general characteristics.

Raw material

The most widely adopted material is obsidian, which is almost twice as frequent as the other types of stone used. Rather than an actual preference for this type of material, this probably means that obsidian tools could usually be obtained on the site itself while most pebble implements had to be brought in ready-made.

This differentiation in tool production activity is indicative of the various uses to which the two large classes of implements, defined by M. D. Leakey as Heavy Duty Tools and Light Duty Tools, were put.

The obsidian artifacts were mostly obtained from pebbles and occasionally from irregular blocks.

Other volcanic rocks (basalt, tuff, lava, trachyte): this is the material mainly used for making Heavy Duty Tools but it was also adopted for a certain number of flake artifacts which only occasionally appear to have been retouched. A more accurate survey of the various rock types is currently being carried out by the Geology Laboratory of the University of Addis Abeba.

Flint: extremely rare in all the sites excavated at Melka Kunturé and represented by a single flake at Garba IV.

Bone: a few small flakes show a striking platform, and bulb as in stone artifacts but none have retouched edges (Fig. 24, *5*).

There are also more complex implements, especially spatulas in one case obtained from a flake of long bone of a hippopotamus and in two other cases from unidentifiable fragments (see fig. 25, *1-3*).

Teeth: the frequency of hippopotamus incisors and canines found in the Garba IVD deposit indicate that these teeth were utilized. However, it cannot be stated with any certainty whether these fragments and flakes were cut or they were detached during the utilization of whole teeth (Fig. 25, *4*).

Horns: the extremities of a few antelope horns show signs of usage, but, generally speaking, the bad state of preservation of these remains makes it difficult to comment on the way they were used.

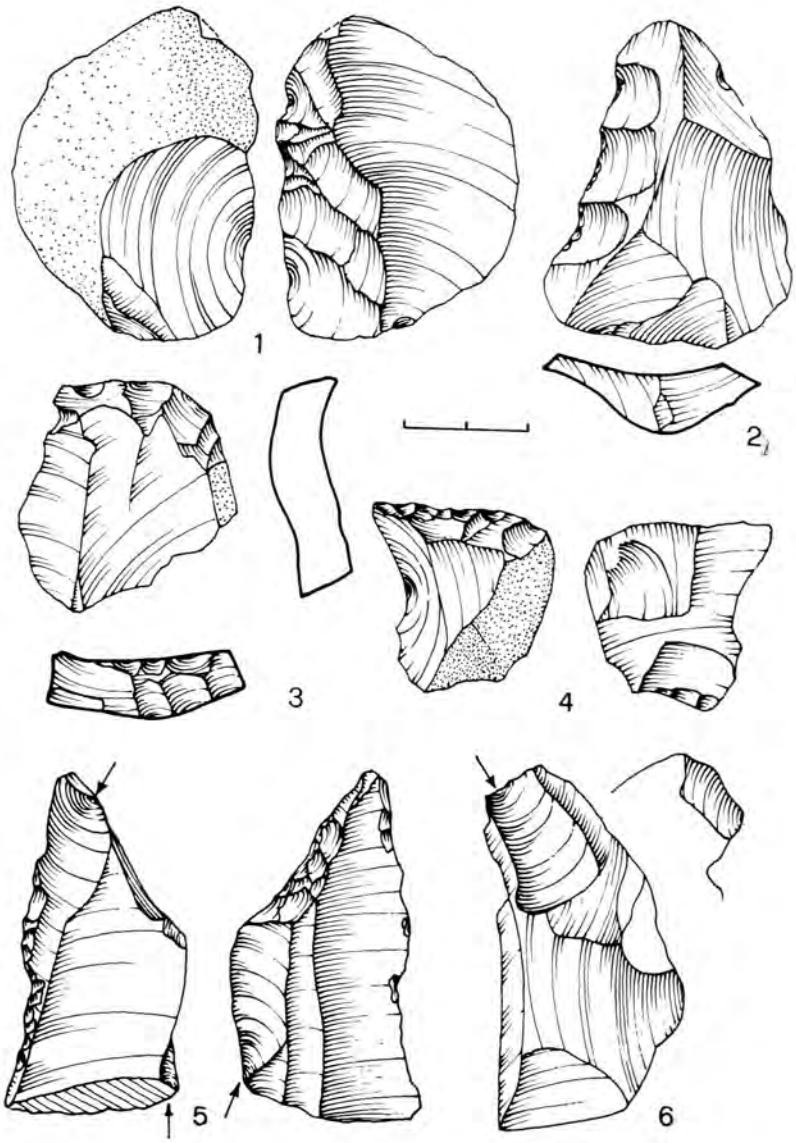

FIG. 20. - Lithic industry from soil D of Garba IV.

1) Side-scraper retouched on the bulbar surface on an obsidian flake with a wide portion of cortex preserved. Bulb partially removed; Platform plain on cortex. Fresh. 52 x 40 x 20 mm (6483, 8E/3N).

2) Denticulated flake on basalt. Dihedral platform. Slightly abraded. 52 x 40 x 13 mm (6542, 8E/3N).

3) Convex transverse side-scraper on a basalt flake. Facetted platform. Fresh. 35 x 35 x 13 mm (1270, 9E/7N).

4) Stright transverse side-scraper with wide portion of cortex preserved. Part of the bulb has been removed by the retouch on the ventral face. Fresh. 30 x 30 x 13 mm (7330, 6E/1N).

5) Side-scraper with alternatively retouch on the left edge of an obsidian flake. The retouch is on the negative of a burin-blow. The proximal side, naturally broken, shows one mire atypical burin-blow. Fresh. 55 x 30 x 11 mm (6691, 11E/6N).

6) Burin struck on the ventral face of an obsidian flake fragment. Fresh. 58 x 31 x 18 mm (1302, 10E/6N).

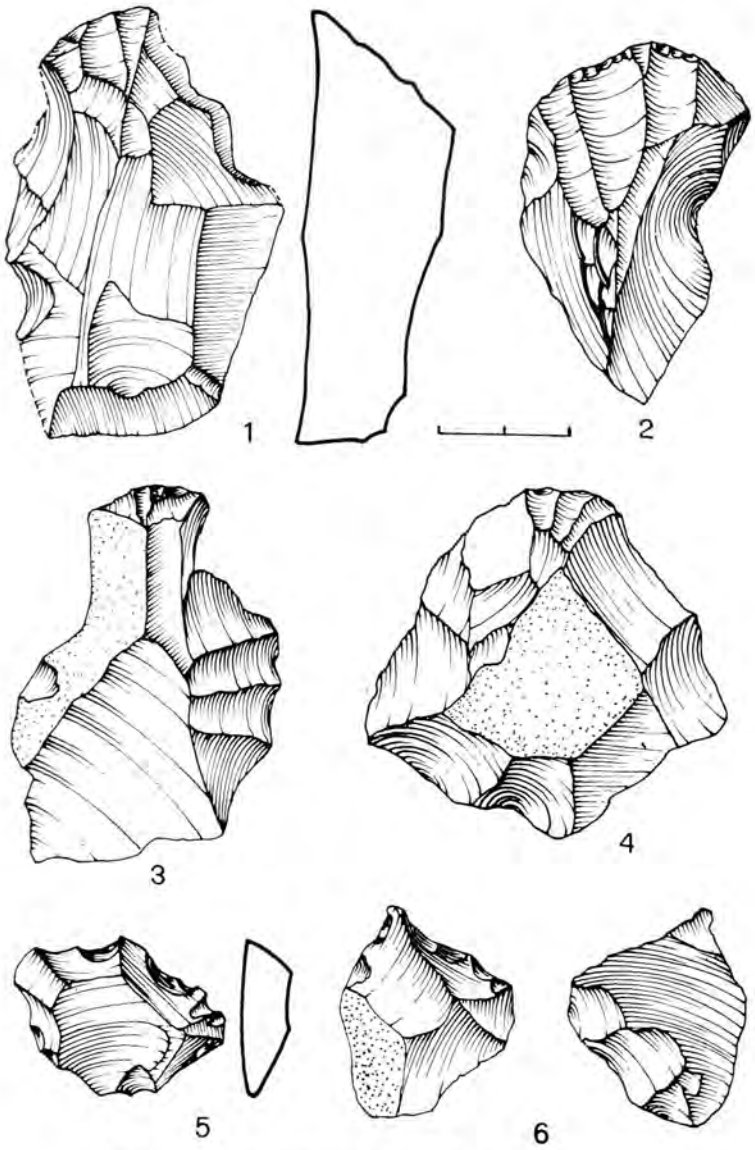

FIG. 21. - Lithic industry from soil D of Garba IV.

1) Frontal end-scraper on an obsidian flake. Bulb removed by extensive flat retouch on the ventral face. Fresh. 65 x 43 x 19 mm (1988, 8E/6N).
2) Frontal end-scraper on an obsidian flake with an unretouched notch on the right edge. The front obtained with convergent sub-parallel retouch shows small scars due to utilisation. The ventral face has been trimmed with an extensive flat retouch. Bulb removed. Fresh. 58 x 35 x 24 mm (6104, 10-11E/6N).
3) Frontal end-scraper on an obsidian flake with portion of cortex preserved. The bulb has been removed with a flat retouch on the ventral face. Platform not visible. Fresh. 61 x 40 x 20 mm (6465, 8E/6N).
4) Atypical end-scraper on an obsidian discoidal flake. The ventral face shows scars, one of which, very deep, is opposed to the front of the end-scraper. Bulb removed. Fresh. 55 x 56 x 21 mm (7034, 9E/6N).
5) Denticulated flake on obsidian. Slightly abraded. 22 x 35 x 10 mm (1308, 9E/6N).
6) Atypical borer on an obsidian flake. The bulb has been removed with two scars on the ventral face. Fresh. 30 x 28 x 13 mm (7222, 9E/4N).

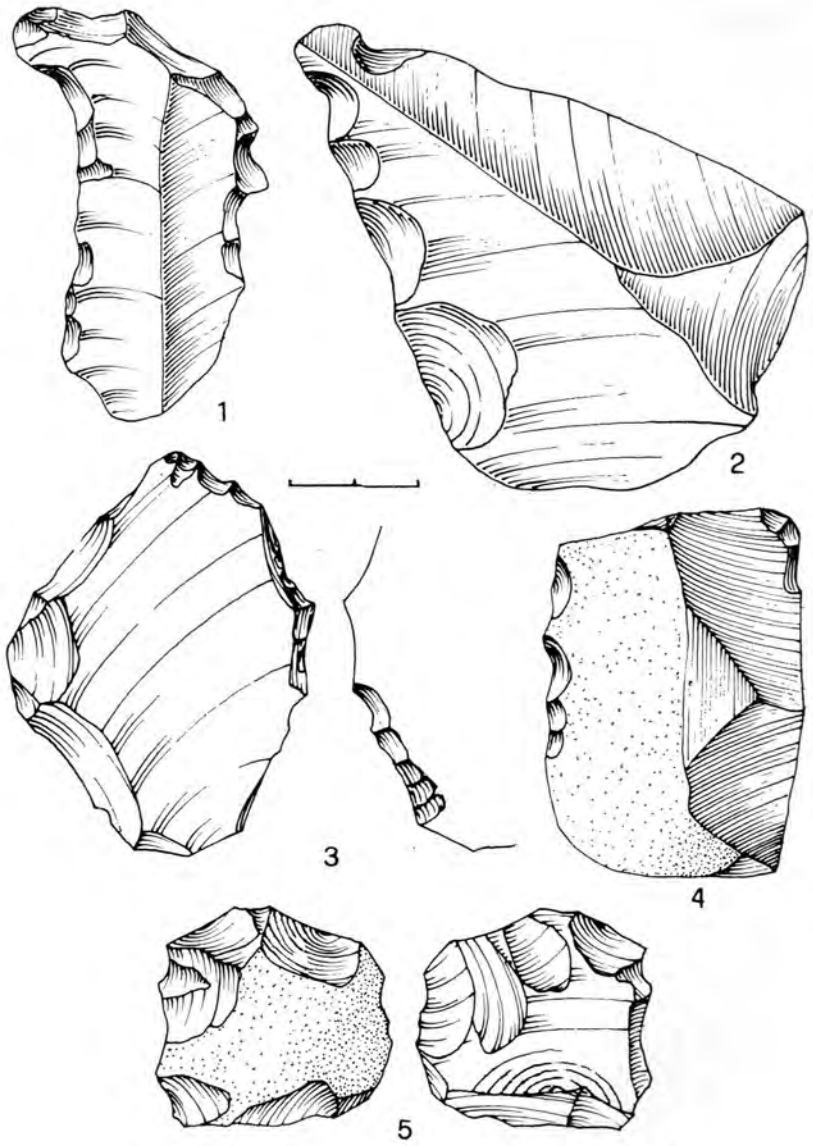

FIG. 22. - Lithic industry from soil D of Garba IV.

1) Denticulated on an elongated obsidian flake. Platform punctiform. Fresh. 65 x 41 x 14 mm (1294, 8E/7N).

2) Denticulated basalt flake. The left edge has been trimmed with large contiguous scars. Platform not visible. Sligthly abraded. 92 x 66 x 26 mm (7386, 11E/5N).

3) Denticulated flake on basalt with alternative retouch. Dihedral platform. Slightly abraded. 61 x 49 x 18 mm (6699, 11E/6N).

4) Denticulated flake on basa't. The distal end of the right edge shows utilisation. Plain platform. Fresh. 59 x 44 x 24 mm (6680, 12E/6N).

5) Disc on a basalt flake with portion of cortex preserved. Fresh. 35 x 37 x 17 mm (1123, 8E/6N).

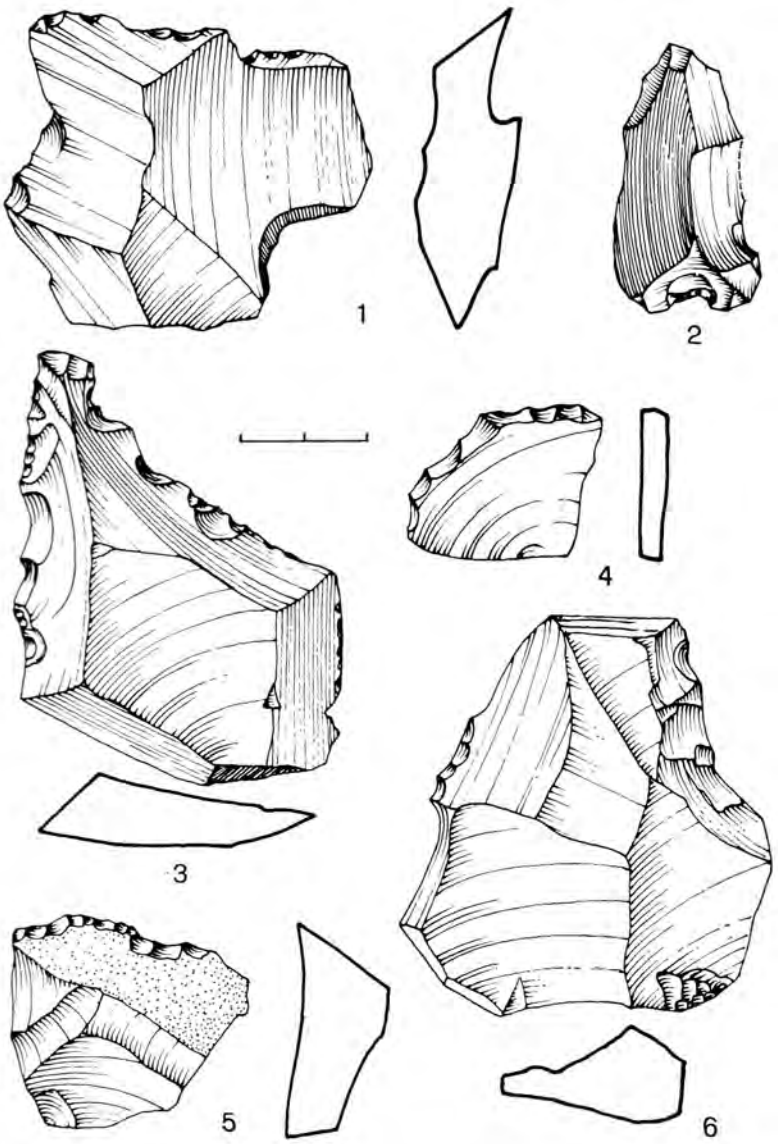

FIG. 23. - Lithic industry from soil D of Garba IV.

1) Slightly denticulated obsidian flake with traces of utilisation on the transversal edge. Fresh. 58 x 50 x 15 mm (6786, 6E/1N).
2) Retouched notched obsidian flake. Platform not visible. Fresh. 41 x 23 x 12 mm (6755, 7E/2N).
3) Denticulated obsidian flake. Retouch rather irregular. Dihedral platform. Fresh. 68 x 52 x 15 mm (6992, 9E/6N).
4) Transversal denticulated flake on basalt. Steep retouch on the ventral face. Platform not visible. Fresh. 26 x 35 x 7 mm (6567, 8E/5N).
5) Transversal denticulated flake on basalt. Plain platform. Fresh. 34 x 40 x 14 mm (6212, 11E/5N).
6) Denticulated flake on basalt. The retouch is limited to the distal end of the right edge. Dihedral platform. Fresh. 60 x 58 x 17 mm (7079, 9E/5N).

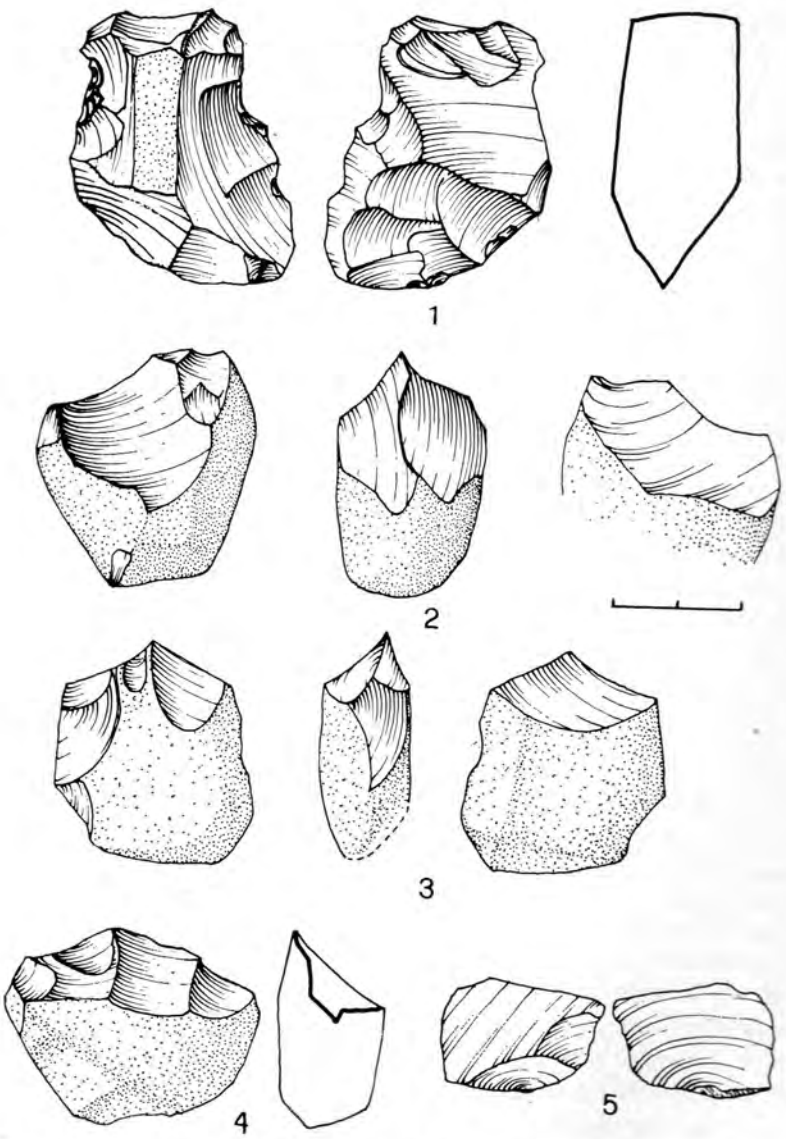

FIG. 24. - 1-4: Lithic industry; 5: bone flake: from soil D of Garba IV.

1) Denticulated flake on obsidian. The bulb has been removed with an extensive flat retouch on the ventral face. Plain platform. Fresh. 45 x 32 x 17 mm (6973, 9E/6N).
2) Small chopper on obsidian bifacially trimmed. The cutting edge is slightly sinuous without traces of utilisation. Fresh. 34 x 33 x 25 mm (1410, 8E/4N).
3) Small bifacial chopper on obsidian. Fresh. 35 x 31 x 17 mm (6588, 8E/4N).
4) Small lateral monofacial chopper on basalt. Fresh. 30 x 41 x 18 mm (1965, 8E/5N).
5) Bone flake with three flake scars on the dorsal face. Plain platform. Fresh. 17 x 25 x 5 mm (1208, 8E/5N).

General technical and typological characteristics

The lenght of flakes varies from 12 to 1 cm; the shape is mainly irregular. Elongated flakes, either of obsidian or other materials, are rare.

Numerous flakes still bearing large portion of the cortex are present, mostly made of obsidian. The striking platform are mostly plain; dihedral ones are rare, punctiform or facetted exceptional.

The striking platforms in most of the obsidian flakes slope strongly with respect to the ventral face, forming an angle exceeding 90° with an average value of 117° calculated in 224 specimens. In the flakes made of other materials this angle is usually smaller. The flakes vary in thickness from 0,5 to 4 cm. The number of dorsal flakes in the basalt implements is generally smaller than in the obsidian flakes.

Retouching seems to be comparatively rare at Garba IVD and is more frequent in obsidian flakes. In general, it is discontinuous and partial. Most common is direct than inverse retouching; the latter is rather extensive and only rarely flat.

The obsidian cores are mostly shapeless and vary in size between a maximum of 9 x 8.5 cm and a minimum of 3 x 3.7 cm. The most common of the morphologically definable cores are the polyhedral ones with the cortex that has been completely removed by flaking. Of special technological interest is a core with a prepared platform from which rather elongated flakes have been detached and a large pyramidal core with numerous peripheral secondary flakes.

In a few cases, the obsidian pebbles have not been exploited to the full and have only 2 to 4 flakes removed with a large portion of the cortex still intact.

Basalt or lava cores are less common, usually incompletely exploited, irregular in shape and vary in size between 17 x 14 cm and 8 x 7 cm; they show occasionally a privileged cutting edge.

Although few in comparison with the total number of flakes, retouched tools nevertheless display quite a wide variety of types. It is curious to note that, in spite of the relative scarsity of artifacts in each single typological class, a few of the latter are particularly typical.

Practically all the implements are on small or medium-size flakes.

Almost all types of side-scrapers are present; déjeté scrapers are common, followed by transverse (straight and convex), simple (straight, convex and concave) and converging ones, retouched on the bulbar surface and with alternate retouching. The more skilfully executed one are transverse and déjeté specimens (occasionally double) obtained from flakes of below average size (Figs. 19, *1-9*; 20, *1*, *3-5*).

As for the types that are usually considered to be more evolved, e.g. end-scrapers and burins (Figs. 20, *6*; 21, *1-4*), both of which are rare, the former are more numerous and often typical, occasionally with skilful sub-parallel retouching. The latter are so far represented by a single, also typical specimen.

Very few typical borers have been found until now. A small number of flakes have a point on which traces of usage are visible (Fig. 21, *6*).

Denticulated and notched flakes (Figs. 20, *2*; 21, *5*; 22, *1-4*; 23; 24, *1*) make up the majority of typologically definable implements. Among the denticulated

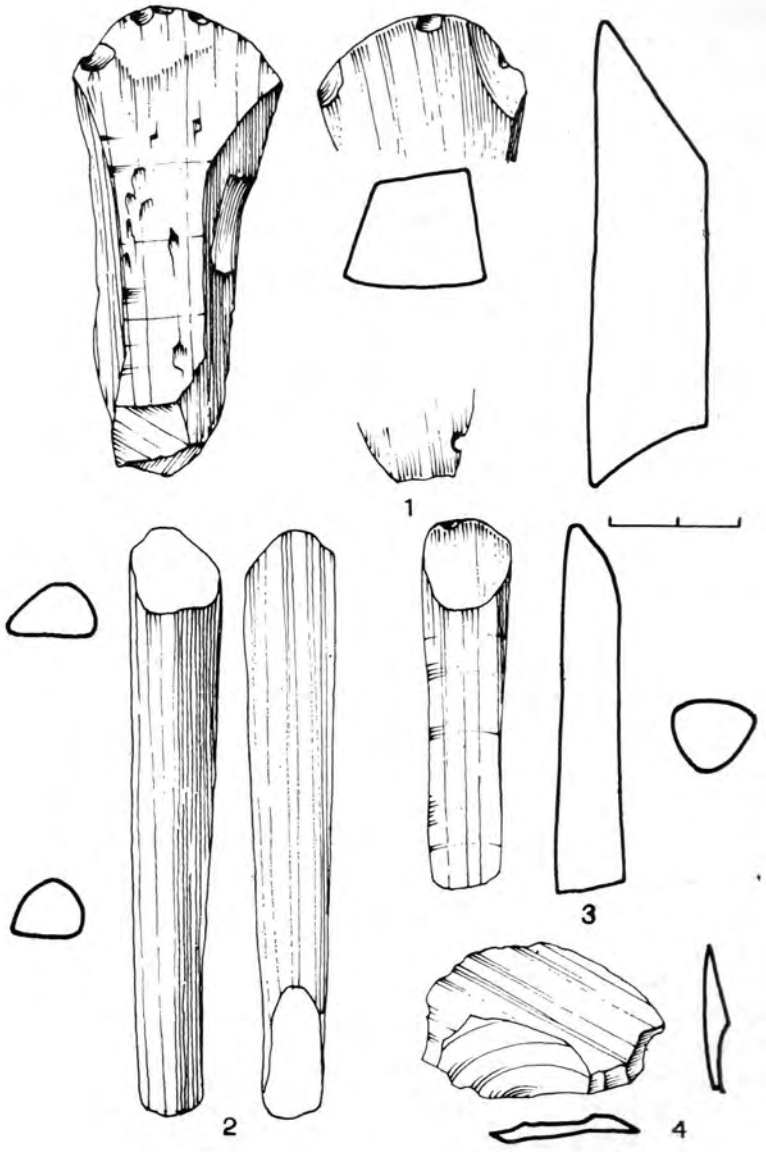

FIG. 25. - Bone tools from soil D of Garba IV.

1) Fragment of an hippopotamus long bone with chipping and traces of utilization on the distal rounded edge. Fresh. 75 x 34 x 18 mm (1422, 8E/4N).
2) Fragment of an indeterminate long bone with a circular cross-section, with both extremities worn smooth. Fresh. 94 x 14 mm (6334, 8E/6N).
3) Fragment of an indeterminate long bone with a circular cross-section and one of the extremity worn smooth. Fresh. 59 x 10 mm (6405, 11-12E/5N).
4) Flake of hippopotamus ivory. Plain platform. Fresh. 24 x 46 x 5 mm (6711, 11E/6N).

specimens, side by side with those with clumsy retouching, there are a few specimens which show a most accurate trimming.

The group of pebble tools is represented by more than 600 specimens at the present time. Included among them are also numerous split pebbles and some with tiny traces of percussion.

Among the tools (choppers, polyhedrons, rabots), the choppers are by far the best represented class (Figs. 24, *4*; 26, *1*, *3*, *4*). Double and monofacial choppers are rare. The most common type is the bifacial with large portions of preserved cortex both at the base and on the two faces. The cutting edge is usually rather sinuous. Both lateral and distal choppers are found. Those with a transverse cutting edge are very rare. In a few cases the cutting edge has an extensive development covering most of the perimeter of the pebble except for a small portion of cortex near the base. Also present are choppers with converging edges and occasionally distal choppers with denticulated edges (Fig. 26, *2*).

Only a few choppers are made from obsidian pebbles, usually small ones (Fig. 24, 2, 3).

The polyhedrons are rather rare. Usually they are partial with preserved cortex and occasionally pyramidal in shape. On the whole there is a deterioration in the workmanship of these tools compared with those found at the earlier site of Gomboré I. The same technical decline, accompanied by a quantitatively smaller production compared with Gomboré I can also be observed in the case of Heavy Duty scrapers. The best specimen is the one, obtained from an irregular pebble with a flat surface, due to a natural fracture, from which three parallel contiguous flakes have been detached that create a clear-cut front 5.3 cm wide (Fig. 26, *5*).

A number of pebble artifacts are characterized by the presence of a platform perpendicular to the axis of the pebble itself obtained by removing one or more flakes, from which a whole series of secondary flakes have been removed. Rather than in that of the cores, these artifacts can be included among the category of the anvils.

Fairly rare are the hammers, which display a completely intact cortex and a small area bearing traces of numerous blows that have caused the core itself to crack and the irregular detachment of tiny chips.

Also rare are small discoidals with centripetal bifacial flaking.

A second obsidian handaxe was found at Garba IVD in 1974. This specimen lacks the finish of the one found in 1973 (14); it is roughly shaped by five primary flakes on one face and seven on the other. The edges are jagged and show traces of utilization at the distal extremity (size 8.2 x 4.2 x 2.8 cm).

A second cleaver was also found in 1974 at the base of soil D in the central area of the excavation, associated with numerous small basalt and obsidian flakes, antelope teeth and fragments of hippopotamus teeth (Fig. 27).

Conclusions

The aim of this paper was to present some of the preliminary results after three seasons at Garba IV (Melka Kunturé). Because of the complexity of the site, its extension and the initial stage of the researches, it is premature to produce

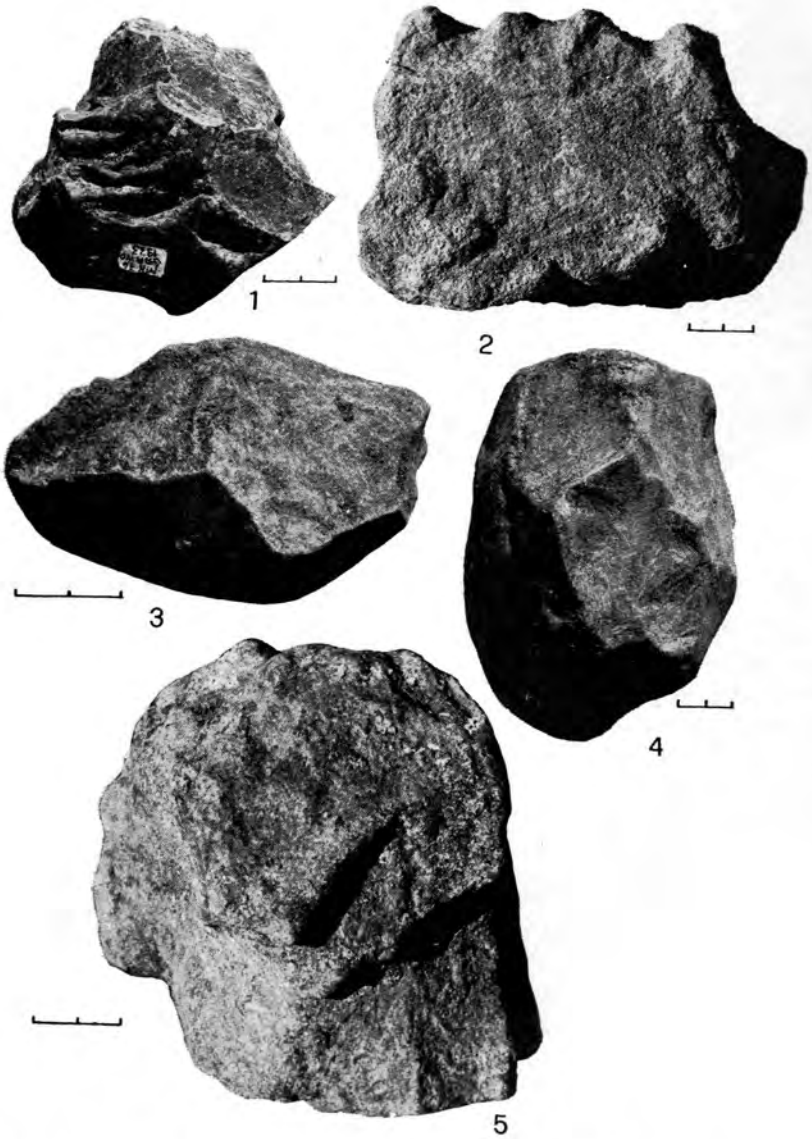

FIG. 26. - Heavy Duty Tools from soil D of Garba IV. 1, 3, 4: choppers; 2: denticulated chopper; 5: « rabot »; Basalt. (Scale in cm).

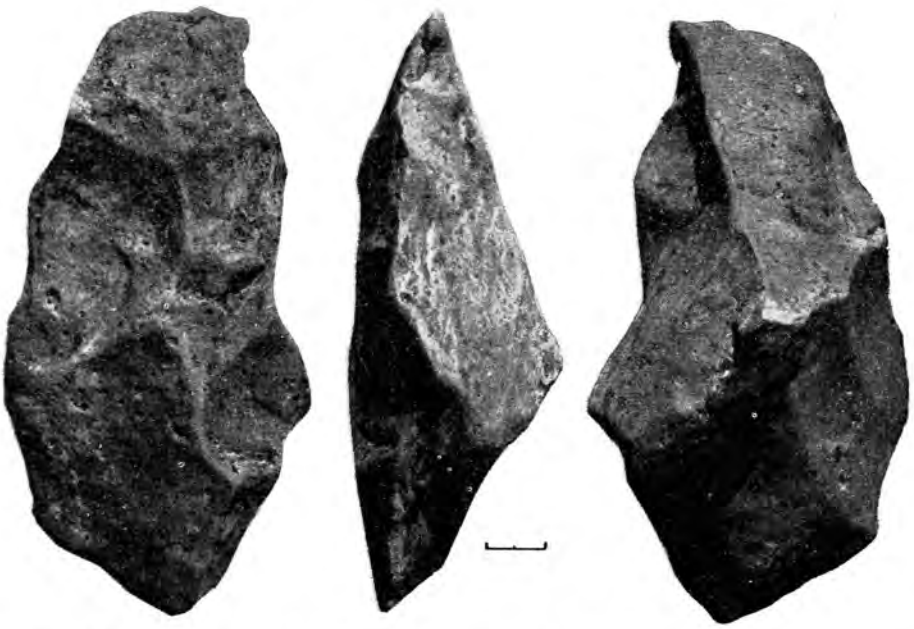

FIG. 27. - Cleaver on a basalt flake found at the base of soil D. 19.6 x 6.4 mm (7216, 8E/3N).

any interpretative conclusion. Even comparisons which can be outlined with some of the Developed Oldowan sites of Olduvai Gorge and elsewhere, are at the moment to be tested.

If the exact position of Garba IV within the Melka Kunturé sequence could be precised by the forthcoming results of absolute chronological determinations, the cultural significance of the site could only be clarified by a more extensive excavations to uncover the entire surface of each archaeological horizon. This will allow the most complete collection of lithic and faunal remains and the very comprehensive locational analysis of the site.

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RIASSUNTO

Si presentano i primi risultati relativi alle campagne di scavo 1972, 1973, 1974 condotte nel sito di Garba IV (Melka Kunturé, Etiopia). Sulla base della sua posizione stratigrafica all'interno della sequenza di Melka Kunturé, delle indicazioni offerte dalle prime analisi polliniche, dell'associazione faunistica e dei caratteri generali dell'industria, il sito può essere in via preliminare correlato con alcuni dei complessi dell'Olduvaiano evoluto di Olduvai. Vengono in particolare esaminati alcuni aspetti dell'organizzazione di uno dei suoli di occupazione ancora in corso di scavo (livello D), e avanzata l'ipotesi che possa trattarsi di un probabile suolo di abitato di lunga durata con strutture permanenti.

RÉSUMÉ

On présente les premiers résultats de fouilles conduites en 1972, 1973, 1974, dans le site de Garba IV (Melka Konturé, Ethiopie). Sur la base de la position stratigraphique dans la séquence de Melka Konturé, des indications des premières analyses polliniques, de l'association faunistique et des caractères généraux de l'industrie lithique, le site de Garba IV (couches C et D), trouve des corrélations préliminaires avec quelques uns des complexes de l'Olduvaien évolué d'Olduvai. On examine en particulier certains aspects de l'organisation d'un des deux sol d'occupation (couche D), encore en cours de fouille, et on propose l'hypothèse qu'il peut s'agir d'un probable sol d'habitat de longue durée avec des structures permanentes.

ZUSAMMENFASSUNG

Von den Ausgrabungskampagnen 1972, 1973, 1974, die andere Stelle Garba IV (Melka Kunturé, Äthiopien) vorgenommen wurden, sollen hier die ersten Ergebnisse gezeigt werden. Präliminar kann der Ort in Beziehung mit einigen der Komplexe des Spätolduvaian gebracht werden. Diese Annahme basiert auf seiner stratigraphischen Lage-im Innern der Sequenz von Melka Kunturé-auf Hinweisen durch die ersten Pollenanalysen auf Fauna und generellen Eigenschaften der werkzeugherstellung. Insbesondere werden einige Aspekte über die Aufgliederung einer der Niederlassungsböden, der noch im Ausgrabungstadium ist (Schicht D), überprüft. Hierbei stellt sich die Hypothese, dass es sich um einen, über lange Zeit bewohuten, mit permanenten Strukturen versehenen Boden Handelt.