

General introduction

The archaeological sites of Melka Kunture

Jean Chavaillon¹, Arlette Berthelet¹

The following is a short description of the main archaeological sites of Melka Kunture (Fig. 1), discovered and partially or extensively explored during the activities of the French archaeological mission.

The sites of Karre I, Gombore I and Garba IV are extensively presented in this volume and they will not be summarized in this chapter.

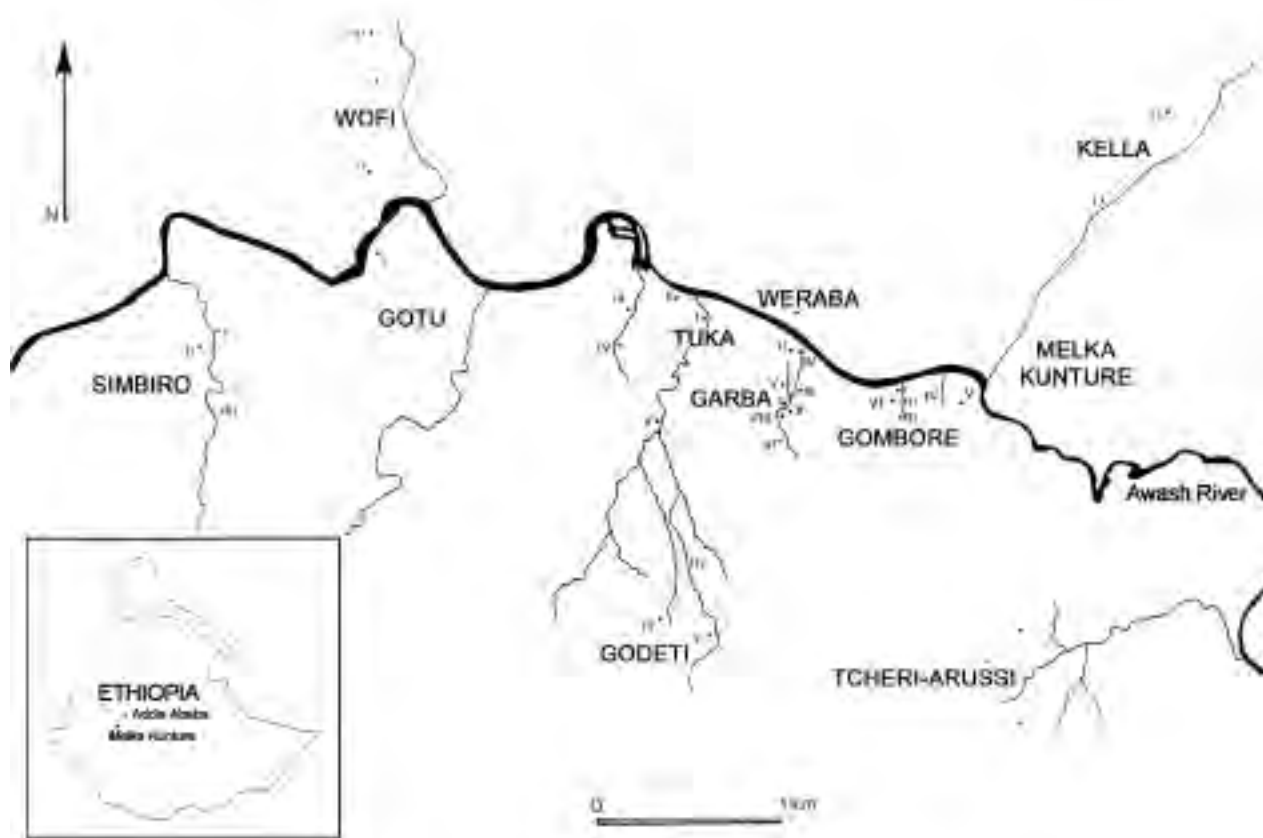


Fig. 1. Location of different archaeological sites of Melka Kunture.

Gombore Iγ

The site of Gombore Iγ first came to light in 1973. The archaeological importance of the locality was already established because of the excavations at Gombore IB-E. Only one archaeological assemblage has been identified on the Gombore Iγ site. This lies at the base of a sequence of fluvial deposits that had brought with it a conspicuous amount of greenish clay. This assemblage is clearly later than Layer B within the same deposit, and would also appear to be later than the Developed Oldowan sequence excavated at Garba IV a few hundred metres away. In all, there were three excavation seasons (1974, 1976, 1978). Twenty-two square metres of the deposit were excavated, and 2000 lithic and bone finds were recovered (Fig. 2). The excavation was supervised by J. Chavaillon for the first year, and subsequently by J.-L. Boisaubert.

Site stratigraphy and chronology

The stratigraphy of the site suggests that the occupation layer of Gombore Iγ lies beneath a series of fluvial deposits. These fluvial deposits are separated from the occupation layer of Gombore IB by a substantial volume of clays and other debris deposited by water washing over the terrain. The latter provide evidence for periods of hiatus of varying length. The archaeological deposit is pertinent to a campsite on the banks of the Awash River. The period of human occupation in this case is clearly later than that at Gombore IB and Garba IV C-D. However, it would also appear to be earlier than the deposit at the base of the sequence on the Garba XII J site. The site can be fixed chronologically between the occupation layers of Garba IV C and Garba XII J. On top of this, the phase of occupation may have preceded the deposition of Tuff A, dated to between 1.3 and 1.1 Ma.

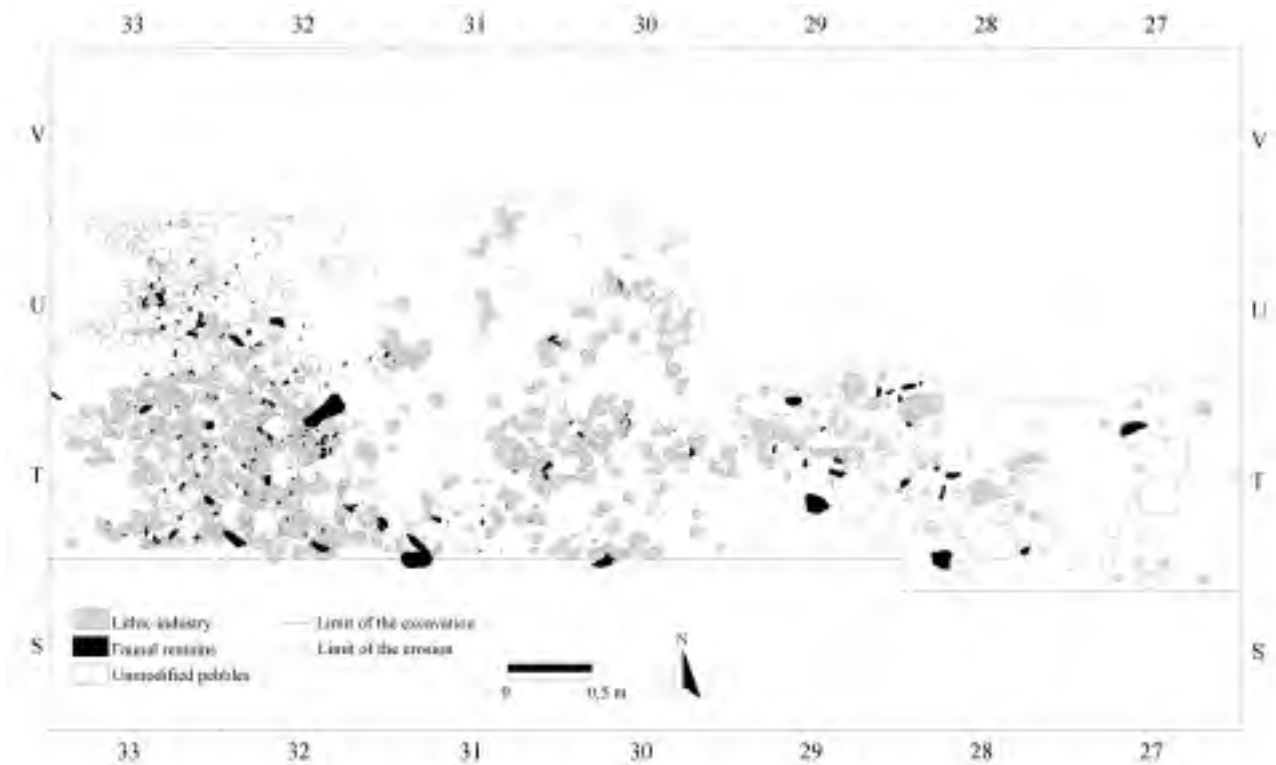


Fig. 2. Plan of the excavation of the Developed Oldowan site of Gombore Iγ.

(Original plan by J.-L. Boisaubert, digital map by R. Gallotti)

Fauna

The faunal remains, which are well preserved, are both numerous and varied (they include teeth and bone fragments over 200 mm long). An abundance of Artiodactyl fragments was recovered. There is a high percentage of hippopotamus bones, identified as *Hippopotamus amphibius*. An abundance of the latter is to be found on most of the sites of Melka Kunture. The faunal remains also include examples of *Metridiochoerus*, *Sivatherium (libytherium) maurusium*, a type of large giraffe, *Redunca*, Hippotragini and *Gazella* (Geraads 1979). Worth noting is the rarity of Alcelaphini as opposed to the relative abundance of Equidae.

Description of one sector of the site

J.-L. Boisaubert's research into the site is still underway. As a result no more than a site inventory is presented here. However, some of the 357 lithic and bone finds from the sector excavated in 1974 will be presented in greater detail. These were collected *in situ* and make up some 20% of the total number of finds from all three excavation seasons put together.

Fauna

Bone fragments from the 1974 season represent some 40% of the total. This percentage remained constant during the subsequent excavation seasons. There is a predominance of bone fragments, though for the most part they are unidentifiable. There is an abundance of fragmentary teeth, with a predominance of Hippopotamidae.

From an anatomical point of view, these bone fragments (only rarely unbroken) include fragments of pelvis, vertebrae, ribs and limbs. A few fragments of horn have been retrieved.

Of the animal species present there is a predominance of hippopotamus, with frequent antelope and gazelle and a substantial number of Equidae.

Lithic assemblage

Lithic tools	1974	1976-78	Total
Anvils	2	39	41
Battered pebbles	7	237	244
Battered and broken pebbles	4	101	105
Broken pebbles	56	269	325
Choppers	15	45	60
Polyhedrons	4	13	17
Heavy end-scrapers	4	9	13
Others	2	47	49
Picks	1		1
Cores	22	31	53
Unmodified flakes	61	174	235
Utilized flakes	9	19	28
Side-scrapers		5	5
End-scrapers	5	9	14
Awls		2	2
Backed knives	2		2
Notches	8	6	14
Denticulates	1	7	8
Retouched flakes	14	35	49
Others	1		1
Total	218	1048	1266

The lithic assemblage of Gombore Iγ.

There are 1266 lithic artefacts, including numerous broken and battered pebbles. The 218 artefacts presented here in detail were recovered during the 1974 excavation. They are all made from volcanic rock, and most of the tools are on obsidian.

Remarks on the lithic artefacts from the 1974 excavation

The percussion group

This stands out as the most important group of artefacts even if it is not the most interesting. It makes up almost a third of the lithic assemblage and mainly consists of broken pebbles. Worthy of note is a small basalt pitted hammerstone. In the 1976-78 group there are both active and passive hammerstones (very large anvils).

Broken pebbles: Of these, 80% are between 40 mm and 100 mm long. Some can be as long as 250 mm. Two thirds of the artefacts are fragments with more than three fractures. Some of these broken pebbles show signs of percussion.

Tools on pebble

Finds belonging to this group recovered during the 1974 excavation were fairly rare.

Choppers: Most of them have been worked on both faces (chopping tools) and lateral and distal choppers are the most common. The tools tend to be relatively small (60 mm-80 mm). One double chopper and one truncated chopper are worthy of note given their length of over 170 mm. Obsidian choppers are rare (13% from the 1974 excavation and only 5% from the 1976-78 excavations put together).

Polyhedrons: There are only 4 basalt small polyhedrons. One of the polyhedrons has been only partially worked.

Heavy end-scrapers: There are 4 thick heavy end-scrapers, together with a rabot.

Picks: The end of a large broken pebble (240 mm) has been worked into a triangular point. The point has signs of secondary working and utilization marks. This could be a rough trihedral pick.

Débitage: cores and flakes

Cores: They make up 10% of the whole and they are as numerically significant as all the tools on pebble put together. Two-thirds are on obsidian. The dimensions of the cores range between 30 mm and 300 mm. Unipolar, bipolar, discoidal, pyramidal and especially polyhedral cores are present. Many of these have a more or less extended pyramidal base.

Débitage: The 101 objects in this category make up 46% of the total. They include unmodified whole or broken flakes, utilized flakes, and retouched flakes (tools on flake). Their length can range between 20 mm and 140 mm, though there is a clear tendency to be between 30 mm and 60 mm. They are often "very large" (transverse flakes). Over half are made from obsidian. Two thirds of the group are unmodified flakes; the rest are either retouched or utilized flakes. The presence of Kombewa flakes is worth noting.

Tools on flake: Of these the end-scrapers are fairly important. Furthermore, of the five end-scrapers, three have been worked from Kombewa obsidian flakes. A few side-scrapers and awls stand out amongst the finds from the 1976-78 excavations.

The most important group consists of notched flakes (8), most of them worked from obsidian. The notches tend to be clearly defined.

The retouched flakes are hard to fit into a typological category but nevertheless stand out as an important group.

Remarks

Although the number of finds from the 1974 excavation is somewhat limited, it is still possible to draw some conclusions from the evidence they present.

There is an abundance of faunal remains, about 40% of the total number of finds. It is interesting that a few fragments of long bone show signs of retouch and utilization marks.

The lithic assemblage includes a large number of hammerstones and broken pebbles, a feature that is typical of Oldowan sites. On the other hand there is a fairly limited number of tools on pebble, though more were found during the 1976 and 1978 excavations. There is a predominance of bifacial choppers, while polyhedrons and heavy end-scrapers are present in limited numbers.

There is a significant quantity of cores and débitage material with a wide variety of core types and numerous flakes. It is worth noting that Kombewa débitage is common here and on the later site of Gombore II, where several obsidian Acheulian handaxes have been worked from Kombewa flakes with a particularly precise trimming technique.

One third of the débitage is made up of tools on flake. These include notched pieces and some end-scrapers.

The site, on one of the sandy banks of the Awash River, was probably not occupied for long and, if it was reoccupied, it would have been for only fleeting visits. This could have been because of climatic conditions, the group's social behaviour or possibly cybernetic reasons.

A brief comparison of the finds from the 1974 and 1976-78 excavations

Taking the lithic finds from all three excavation seasons together, a few observations are possible.

All the Melka Kunture sites have furnished us with a collection of "unworked" artefacts, such as true hammerstones, or other types of objects that may or may not have been used. These include so-called battered pebbles (occasional hammerstones), and broken pebbles with one or more fractures.

The abundance of these artefacts may well help us to interpret the behaviour of the occupants of the site, but at the same time their high number overshadows the importance of the far less numerous real tools, worked from both pebbles and flakes.

This is why the number of broken and battered pebbles has deliberately been eliminated from the summary table below. The pieces that are listed in this "percussion category" include only true hammerstones.

All of the trimmed pebbles have been grouped together, including choppers, polyhedrons and others, as have the groups of flakes and tools on flake.

Types	1974	1976-78	%
Hammerstones	1.32%	8.84%	6.92%
Trimmed pebbles	16.56%	25.85%	23.48%
Picks	0.66%		0.17%
Cores	14.57%	7.03%	8.95%
Unmodified flakes	46.36%	43.77%	44.43%
Tools on flake	20.53%	14.51%	16.05%

Percentages of the lithic assemblage of Gombore Iy.

Only 592 artefacts have been taken into account, 151 from the 1974 excavation and 441 from those of 1976-78. The summary table brings to light a series of points for analysis.

- There is a significant number of hammerstones (active, passive or anvils, pitted hammerstones) from the 1976-78 excavations.

- There is a notable number of worked pebbles (almost 25% of the total lithic assemblage) in both groups of excavations.
- There is a clear prevalence in the number of cores (with both a single or double striking platform) from the 1974 excavation.
- The percentage of unmodified flakes is constant in different sectors.
- There are statistically more tools on flake from the 1974 excavation. For the most part these include end-scrapers, backed knives and notches, as well as a few side-scrapers and awls found during the 1976-78 excavations.

Conclusions

The abundance of tools on pebble in the lithic assemblage brings to mind the same feature from Oldowan sites. The growing number of débitage and cores is significant, making up some 60% of the whole. Statistically, there are fewer tools on flake, though they are typologically very well developed.

The Garba region

The Garba region is stratigraphically comparable to the Gombore sites. All that separates the Garba region from Gombore is a narrow deep gully. Various Oldowan (Garba IV), Early/Middle Acheulian (Garba XII), Upper Acheulian (Garba I) and Late Acheulian (Garba III) sites have been found in the region.

Garba XII

The Garba XII site first came to light between 1965 and 1966, though no trial trenches were undertaken. Excavation got underway for an unexpected reason. In 1977 an abundant and slow moving flood of the Awash River led to the Gombore IB site being immersed by the floodwater making it impossible to continue the excavation begun there in 1976. As a result J. Chavaillon decided to put a trial trench on the Acheulian site of Garba XII. Excavation continued under his supervision until 1979. Approximately fifty square metres were excavated, and several archaeological layers were identified. Of these, three are ancient occupation layers (Figs. 3-7). The study of the lithic assemblages from the site was carried out by J. Chavaillon, N. Chavaillon and A. Berthelet. Yohannes Zeleke and Assagedech Mabrat represented the Ministry of Youth, Sports and Culture on site during these years.

Excavation and stratigraphy

Garba XII is one of the earliest sites in the stratigraphic sequence of the region (“*ravin*” A after M. Taieb 1974). On Y. Egel’s map the Tuff (B?) overlying the site lies at 2021 m above sea level, some nine metres above the present-day course of the Awash River. The excavation lies 100 m from Garba IV and approximately 200 m northwest of the entrance to the archaeological camp site.

The regional stratigraphy annotated by M. Taieb places Garba XII in the “Garbien” stage. The deposit dates from J. Chavaillon’s “third phase” and finishes with the first sedimentary cycle of the “fourth phase”.

The Garba XII section is 5.5 m high. Two metres of stratigraphy lie between two Tuff layers annotated as A and B (Chavaillon 1979c). One metre and a half of the Garba XII deposit lying between the two lay-

ers of tuff was excavated and analysed. Five archaeological layers were identified and excavated: J, I, H, E and D. A colluvium separates Layer I from the underlying Layer H. This could provide important evidence of a hiatus in the stratigraphic sequence lasting more than a few tens of thousands of years. Two theories could explain the absence of an archaeological deposit: one, that it never existed; and two, that it was subject to repetitive sedimentary erosion. The three metres of deposit prior to the phase of occupation have been recorded in a test pit. Two anthropogenic layers, apparently very poor but as yet not excavated, were identified, one at the base of the test pit (L) and one at the top (K) above the layer of Tuff A.

The following is the stratigraphic sequence, from top to bottom, with the thickness (in cm) of each layer:

Upper part of the sequence:

20 cm - Well compacted grey clayey Tuff forming a rock bank.

5 cm - Bed of very fine pumice (*Tuff B sequence*).

25 cm - Compact yellowish fairly clayey tuff.

45 cm - Brownish violet coarse sand.

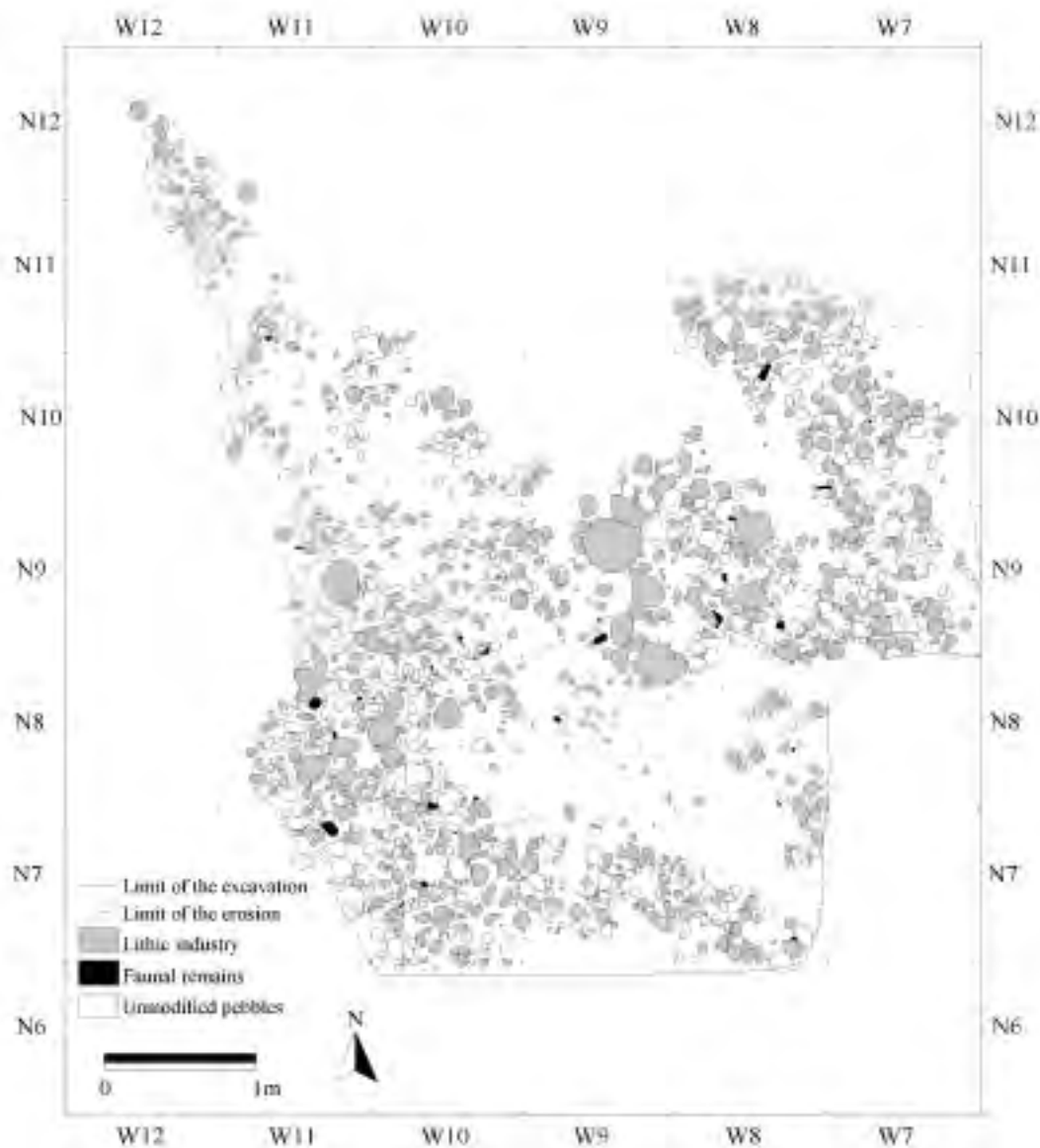


Fig. 3. Plan of the excavation of the Early Acheulian site of Garba XII J.

(Original plan by C. Chavaillon, digital map by R. Gallotti)



Fig. 4. Garba XII. Early Acheulian. *To the left*: stratigraphy of the different Levels from B to J. To the top is possible to see the Tuff B and, to the bottom, the base of the Early Acheulian Level J. *Top to the right*: view of the excavation during 1978. *Bottom to the right*: the excavation of three main Acheulian levels: from bottom to top Level J, Level H and Level D.



Fig. 5. Garba XII. Early Acheulian. Level J. *Top*: limit of a possible shelter built with small circles of stones. *Bottom*: area of chopping or fragmentation. Some big cobbles surrounded by choppers and, to the middle of the photo, a cleaver.

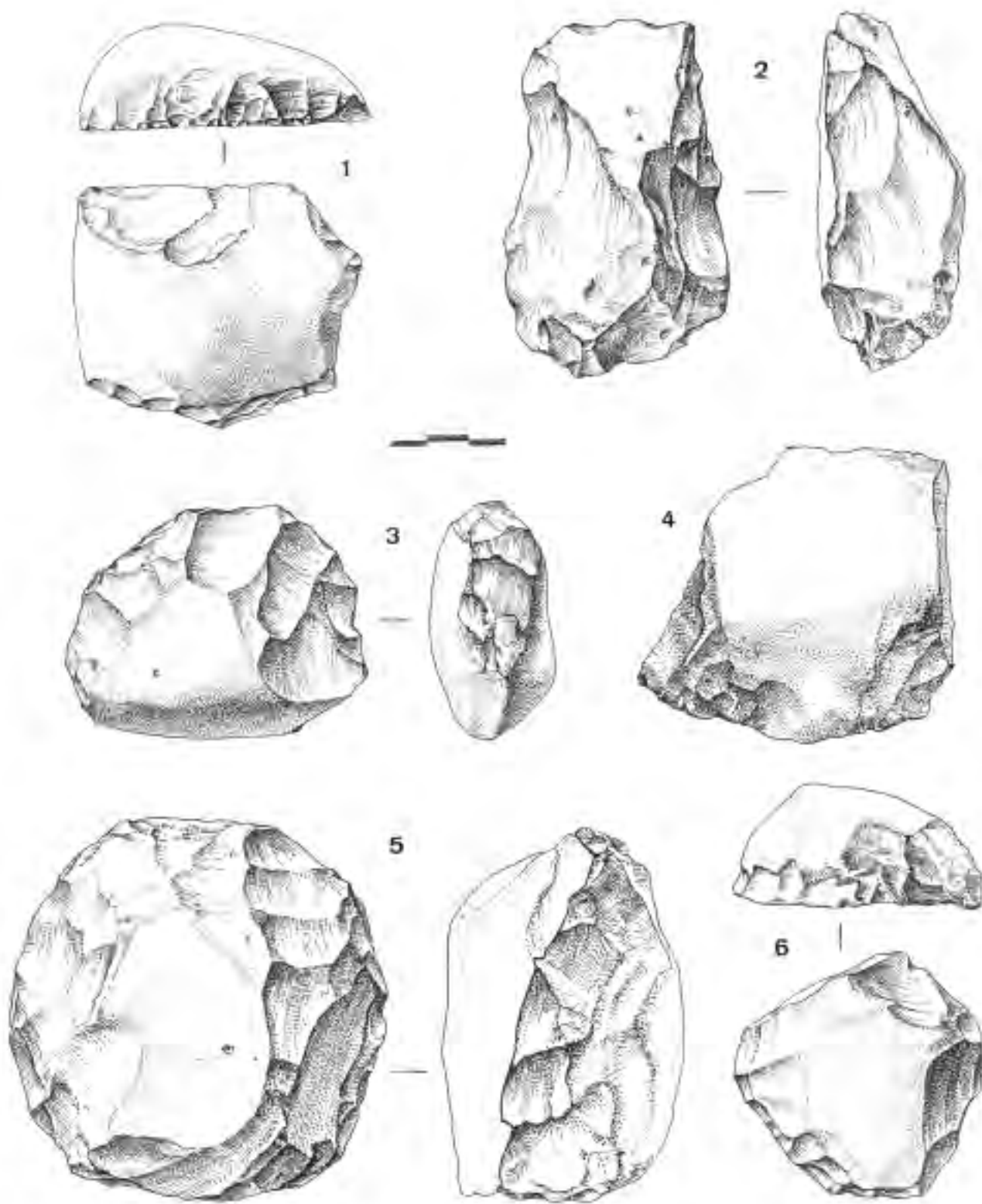


Fig. 6. Garba XII. Lithic industry from Level J, Lower Acheulian. 1: end-scraper on pebble; 2: cleaver; 3: peripheral chopper; 4: end-scraper on pebble; 5: spheroidal polyhedron; 6: end-scraper on pebble. Basalt. Drawings by C. Chavaillon

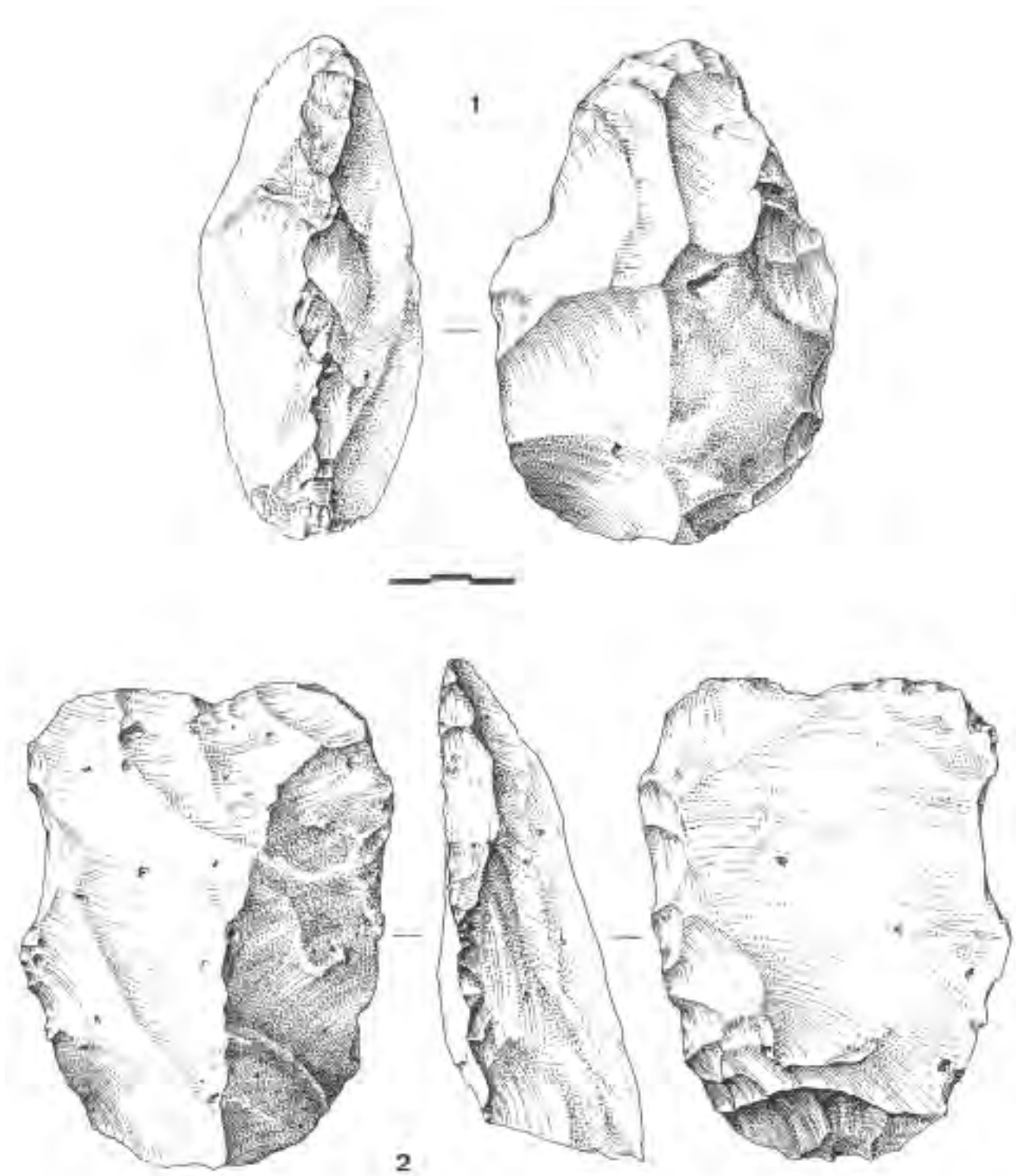


Fig. 7. Garba XII. Lithic industry from Level J, Lower Acheulian. 1: handaxe; 2: cleaver. Basalt.

Drawings by C. Chavaillon

Minor erosion phase:

24 cm - Yellow tufaceous clays.

10 cm - *Layer D*. With fine gravel inclusions and sand. Frequent artefacts of a regular shape and size with obsidian and basalt flakes.

11 cm - *Layer E*. Laminated overlapping sandy deposits. Some small flakes and tools on flake were recovered within the layer but were out of context. It is possibly an occupation layer that has been subjected to interference or secondary deposition so that the objects are no longer *in situ*.

Minor erosion phase:

5 cm - *Layer G*. Is a tufaceous layer.

15-5 cm - *Layer H*. Brownish fairly tufaceous clays: in the upper part a large cleaver, a heavy bola, and several flakes. This layer has been partly eroded.

Major erosion phase:

40 cm - *Layer I*. Grey clays that sandwich an anthropogenic layer poor in finds, with occasional artefacts: choppers and flakes.

10 cm - *Layer J*. Gravel beds covering the previous layer. This is the most important archaeological unit on the site, having yielded some 5000 artefacts.

20 cm - Beige sandy clay sedimentary deposit.

Base of the sequence and end of the excavation, top of the test pit:

40 cm - *Layer K*. Tuff mixed with clays. Barely discernible traces of organic remains. Infrequent lithic artefacts.

115 cm - *Tuff A* conglomerate. Tuff deposited in water or disturbed. Thin layers. Ash grey tuff corrupted with pockets of clay. Towards the base of the context Tuff A is free of inclusions and rich in small fragments of volcanic glass.

90 cm - Brownish red sands, ochre, occasionally cemented with small fragments of quartz and gravel; ferruginous and encrusted elements.

20 cm - Laminated marl with an encrusted ferruginous surface.

40 cm - Homogeneous sands. At the core of this layer there is a gravel level (length 1 cm) and occasional large pebbles.

5 cm - Ferruginous crust.

15 cm - Green clay.

5 cm - *Layer L*. Occasional pebbles, one broken bone.

10 cm - Green clay.

*Base of test pit**Dating*

Palaeomagnetic samples were taken to date the site by J.-J. Jaeger and were analysed by Ph. Cressier in the Geophysics Laboratory of Strasbourg. The results of the analysis dated Tuff A to 1.3-1.1 Ma. Tuff B coincides with the Jaramillo Event (around 0.85 Ma). Tying these results in with the stratigraphy of the site and the typology of the artefacts, Layers H and D would appear to date to around 0.85 Ma, whereas Layers I and J would be closer to 1.0 Ma.

Fauna

Faunal remains are poorly represented, but their state of preservation is good. *Hippopotamus amphibius* remains have come to light throughout the stratigraphic sequence, but predominantly in Layer J. This explains why large leg bones and fragments of teeth are mixed in with the lithic assemblage.

Suid remains were also present in the faunal record. Worth noting is a fragment of jawbone recovered from Layer J: identified as *Theropithecus (Simopithecus)* sp., the biotype of this primate is close to that of the present day baboon. The latter provides evidence that the zone was neither forest nor desert, but savannah. This rare and fragile fragment of bone suggests that the relative infrequency of bone finds in context J is not so much due to subsequent destruction (be it chemical or otherwise) of the archaeological context, but more to the meagre quantity of animals eaten or brought to this spot by man or beast.

Conditions of the occupation layer

In spite of the limited area excavated (50 square metres), it is possible to hypothesise about the characteristics of the primary layers. The bottom Layer J stretches out over the sandy clay and gravel beach of one of the banks of the Awash.

Anthropogenic Layers H and particularly D would appear to be the sandy bed of a small tributary of the Awash, or a minor branch of the river running parallel to the main stream. A similar situation can be found up-river with the small Simbiro tributary and on the Melka Garba site above the waterfall.

Lithic assemblages

The Garba XII archaeological sequence falls into the Early/Middle Acheulian (1.1-0.8 Ma). The lithic industry from Layer J has been dated to about one million years ago and has certain archaic characteristics though some appear more recent. On the other hand the lithic assemblages from Layers H and D seem to be younger.

Layer J

The lithic assemblage shows signs of transition (Chavaillon and Chavaillon 1980). There are frequent manuports (large stones) and broken and battered pebbles. These characteristics clearly echo the situation on the Oldowan sites of Gombore I and Garba IV.

There are frequent choppers, but certain typological and technical characteristics appear to be decidedly evolved. The consistently high proportion of lateral choppers and distal choppers, whether mono or bifacial, on Gombore IB, Garba IV and Garba XII J is counterbalanced by the varying number of choppers with a peripheral cutting edge. There is a very limited number of the latter in the Oldowan layers of Gombore IB, they are much more numerous on the Garba IV site, and even more frequent on the Garba XII J site. These tools are the forerunners of the handaxes, especially those from Layer J as the cutting edge is better prepared and far steeper. This testifies to the fact that this is without doubt an Acheulian level. The other types of tools on pebble decrease in number during the Oldowan; there are polyhedrons, heavy end-scrapers (amongst which there are large heavy-duty rabots) and notches on pebbles.

The most evolved tools are the handaxes and cleavers. The handaxes, though very rare and typologically archaic during the Oldowan (archaic handaxes), are markedly more frequent in this layer, though proportionally far less in number than the other large tools. The artefacts tend to be worked from pebbles while those obtained from large flakes are very unusual. Their shape and characteristics vary but are simi-

lar to the so-called “Abbevillian” handaxes, not so much for their shape as for the procedure employed in their manufacture. Some of these artefacts substantiate that people had fully grasped the technical skill that was to evolve into the Middle Acheulian tradition.

There are fewer cleavers than handaxes, and they tend to be worked from thicker flakes. There is only casual secondary retouch on the edges. The cutting edge, though free of any secondary working, is apparently more similar to chopping tools than to the angular flat cleavers of the Upper Acheulian of Garba I.

Though the Acheulians who may have frequented occupation Layer J might have started to employ an archaic technique for the manufacture of some of their tools on pebble, their “débitage” is still short of the mark. In fact, the Acheulians were to improve core preparation. The consistency in the shape of some of the cores and the employment of specific techniques imply that there was a certain degree of standardisation. The flakes continue to show certain Oldowan characteristics: for example cortex tends to be present on the dorsal face of many flakes and plain butts are the most frequent. Butts are frequently linear or scaled, especially in the case of obsidian artefacts.

Flake artefacts are proportionately more numerous than on the Oldowan sites and the procedure for their manufacture is apparently more regular and systematic. As is the case with the cores, preparation appears to be a standardised technique and typology. There is now an abundance of side-scrapers, and step retouch is a widespread procedure.

Layer H

Apart from present day or recent interference, the excavated area of Layer H is somewhat limited due to the erosion of the overlying anthropogenic levels (Layer G). For this reason there is a limited amount of data from this layer. The lithic artefacts are produced with an increasingly refined technique. The flakes are thinner and flatter. A large basalt cleaver corresponds with the morphological and technical standards of the Middle Acheulian cleavers from Gombore II and anticipates the Upper Acheulian tools from Garba I. A regularly pitted bola was found next to the cleaver. The same somewhat curious association between these two artefacts has already been documented at Garba I.

Layer D

This layer has many basalt as well as obsidian flakes. There are numerous tools on flake. Unfortunately the surface area of the excavation is somewhat limited (10 square metres). There is an abundance of scrapers, end-scrapers and awls. However, the absence of larger artefacts such as choppers, polyhedrons and large handaxes, could be explained away as a natural phenomenon: erosion may have disturbed the surface of an archaeological level gradually dragging with it only the smaller elements and flakes before depositing them below.

Economy and spatial organisation on the site

Some aspects show that the behaviour of these Acheulian groups was more evolved than that of the Oldowan population. However, the spatial organisation of Layer J still clings to some of the aspects of the earlier period. There is evidence for a kind of synthesis as well as an evolution from Oldowan to the Acheulian lifestyle.

In Layer J, some handaxes, choppers and polyhedrons and one cleaver were dispersed around a few very large stones. It is no surprise to find an area such as this, set aside for crushing, grinding and cutting; but in this case there is intentional spatial organisation. The large blocks have been grouped together. Some of the bone fragments are unbroken, but many more were found on the surface shattered into tiny

pieces, enough to suggest an intensive and abundant shattering process, something that was to increase systematically throughout the Acheulian. Of the various layers, Layer D shows signs of being the most evolved. The bone splinters are fragments of long bones probably shattered by man. It should be borne in mind, however, that this layer could have been formed artificially following the destruction of a nearby Acheulian level, leaving only fragments of a certain size or weight to be transported by the river current.

Close to this alignment of large heavy stone blocks in Layer J various small areas, some two to three square metres, have been identified. These areas are almost completely devoid of finds, a situation that echoes others found on Oldowan sites. Within one of these blank spots, close to a gravel bed, a few unmodified pebbles came to light. One of these conserved on its underside the imprint of some vegetable remains (some species of grass according to R. Bonnefille). Could this have been an area where vegetation was used for bedding?

A few metres away, an extensive area was identified, free of either artefacts or unmodified pebbles. On the surface a sequence of small stone circles could be picked out, possibly where posts or branches had been wedged into position with large stones. The sequence of hypothetical posts was enclosed within a secondary, larger stone circle. During preliminary studies of the sites, this situation was interpreted as indicating the presence of a possible artificial shelter. There were a few rare objects within the limits of the hypothetical structure. Two large hippopotamus bones, one humerus and one femur, were found in the immediate vicinity, to the south-east and north-east.

Conclusions

Though the archaeological deposit as a whole probably belongs to hominids close to *Homo ergaster-erectus*, the Garba XII site can be interpreted as a moment of transition between two civilizations or techno-complexes, Oldowan and Acheulian. This is important because though the lithic assemblage from Garba XII J presents archaic characteristics, there are also certain new techniques that were used. As for spatial organisation, the existence of an area set aside for crushing, grinding and cutting is archaic, as is the overall layout of the site. Only the hut floor provides concrete evidence of an evolution in the behavioural pattern. Melka Kunture presents technical and cultural continuity as well as various elements (stone knapping, the production of handaxes and the presence of possible built structures) that demonstrate a degree of evolution on the site, though it is unclear whether these occur simultaneously or not. Each and every cultural characteristic follows its own erratic and unstoppable process of evolution (Chavaillon *et al.* 1978, 1979).

Simbiro III

The Simbiro III site (Fig. 8A-D) was first identified by M. Taieb. It lies some five kilometres upstream from the Melka Kunture ford on the Awash River. The Simbiro stream is a seasonal tributary of the Awash River. At present, at its confluence with the Awash, a bar of welded tuff creates a waterfall.

This ignimbrite substratum is identical to that of Gotu and Melka Garba (Kieffer *et al.* 2002). Broken lumps of rock can be found in the gravel of Garba IV, Karre I and Gombore I in the form of fairly rounded pebbles. The flood deposits found on the Simbiro III site, as on the Gombore and Garba sites, are made up of pebbles, sandy gravels and clays. The stratigraphy of the site is more or less made up of phases of sedimentation loosely tied to climatic cycles, interspersed with volcanic deposits from occasional eruptions. Groundwater washing over the terrain carried the ash and pumice down into the valley from where it was carried downstream by the Awash or one of its tributaries, mixing it in with the alluvial deposits.

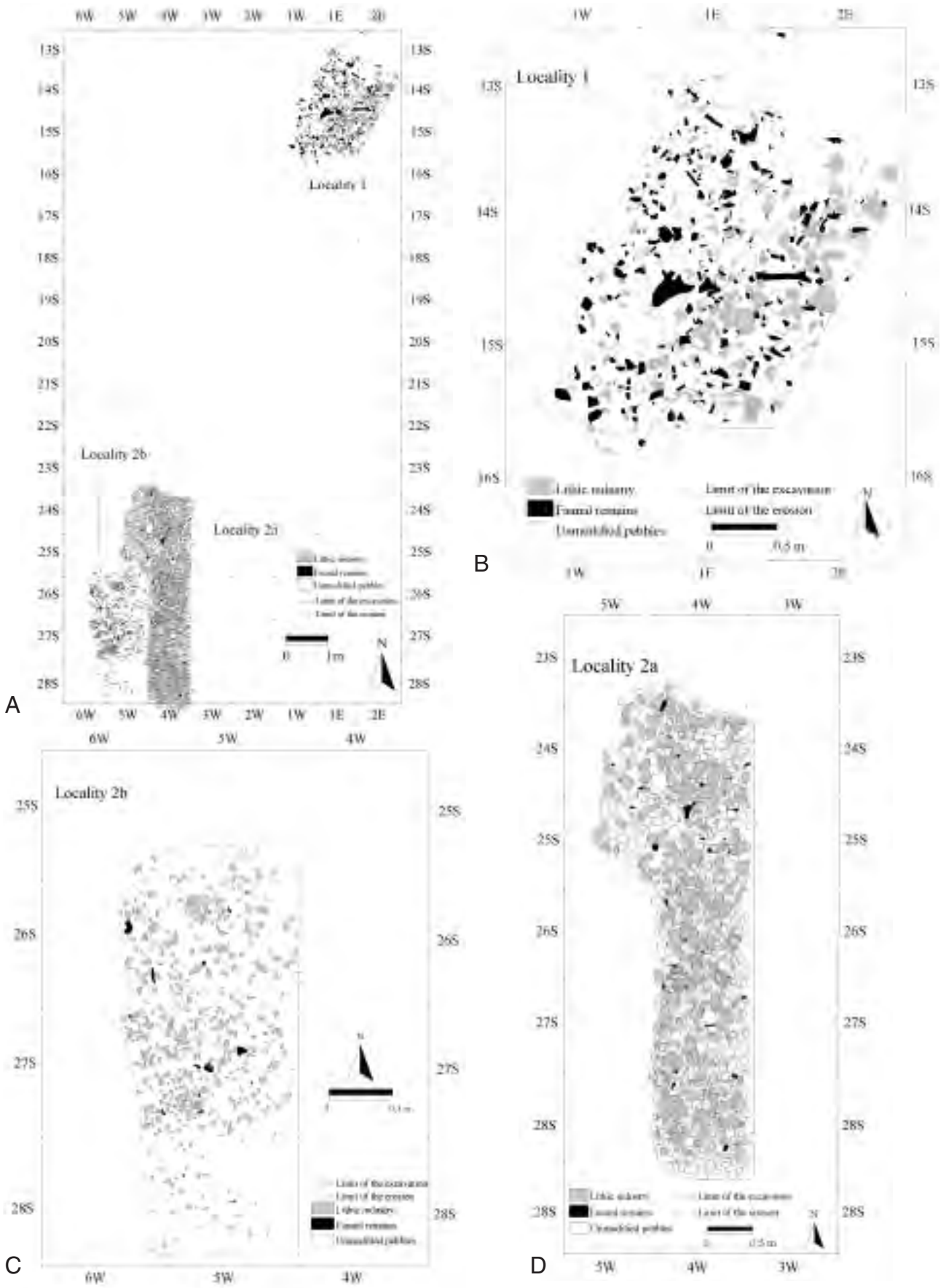


Fig. 8. A. General plans of the excavated areas of the Early Acheulian site of Simbiro III. B. Plan of the excavation of *locality 1*. C. Plan of the excavation of *locality 2b*. D. Plan of the excavation of *locality 2a*. (Original plans by J.-L. Boisaubert and C. Brahim, digital maps by R. Gallotti)

Stratigraphy

The archaeological deposit that has been excavated lies below a significant sedimentary deposit (a principally fluvial deposit up to several metres in depth). In 1970-74 the layer of volcanic ash sealed beneath this deposit was tied to "Tuff B" of Garba and Gombore. The distance of some four kilometres between Simbiro, Garba and Gombore hinders the clear association between archaeological sequences on the various sites.

The uppermost archaeological layer, Level A or top level, includes a lithic assemblage that shows signs of being fairly archaic in its manufacture, with frequently smoothed artefacts. This Level is present only on the lower slopes of the site. Its geological make-up consists of small pebbles mixed with sandy gravels.

Below this lies Level B, the most significant level of Simbiro III with the highest number of lithic artefacts. This level consists of coarse gravels overlying a sandy layer. The underlying Level C is a layer of volcanic ash with numerous obsidian artefacts and some fragments. The high number of handaxes and other obsidian artefacts present in the lowest layer is remarkable. Level C varies in thickness and has been shifted by groundwater washing over the terrain – so much so that a part of the underlying Level D lying on the higher slopes has been eroded by this movement. As a result the bottom layer of Level C, which includes frequent handaxes and obsidian waste, is stratigraphically inverted compared to Level D. Level C is not an occupation level, but rather an interesting deposit of solely obsidian artefacts.

Level D is made up of coarse gravel mixed with sand and gravel. The tools on pebble comprise numerous examples worked from volcanic rock, including obsidian.

Archaeological site survey

The Simbiro stream was prospected as part of the Melka Kunture archaeological project. In 1973 erosion partially brought to light evidence of a *Pelorovis* skull. A limited dig enabled these exceptional paleontological remains to be lifted. The remains lay sealed within a layer of compacted coarse gravels, Level B. Numerous lithic objects also came to light, including archaic handaxes and cleavers. The latter were made from either tuff or basalt.

In the three seasons of digging between 1974, and 1976 a trial trench was excavated through Levels A, C and D. A small scale dig took place in Level B, where the *Pelorovis* had lain. The site was supervised by O. Oussedik with the assistance of C. Brahimi, S. Karkabi and J.-L. Boisaubert among others.

Four archaeological levels were excavated. The somewhat problematic nature of the archaeological sequence has been outlined by O. Oussedik among others. Level B includes smoothed objects that could well have originated from an earlier layer that had been destroyed by erosion. O. Oussedik's analysis of the lithic assemblage (Oussedik 1976a, b) was taken up only several years later by A. Berthelet and J. Chavaillon.

Excavation of Level D

This is the earliest layer. Some three square metres were excavated in 1974 given that the archaeological deposit had been heavily truncated by natural erosion. This level is clearly defined when compared to the other layers of Simbiro III. However, some fifteen metres further up the slope its relationship with Level C is less obvious. The limited surface area of the excavation plays heavily on the limited number of finds. There are 145 finds, consisting of 113 lithic objects and 32 faunal remains.

Lithic tools	A	B	C	D
Anvils and battered pebbles	11	13		4
Broken pebbles	35	78	27	2
Broken and battered pebbles	2	22		
Total	48	113	27	6
Choppers	8	25		4
Polyhedrons	2	17		8
Heavy end-scrapers	5	6		7
Others	2	17	1	4
Total	17	65	1	23
Handaxes	1	79	17	1
Cleavers		63		3
Small bifacial tools	2	2	2	
Total	3	144	19	4
Cores	7	17	3	4
Total	7	17	3	4
Unmodified flakes	61	98	167	20
Utilized flakes	11	51	11	6
Total	72	149	178	26
Side-scrapers	10	36	13	3
End-scrapers	5	12	9	
Awls-perforators	5	6	3	
Notches	6	23	28	5
Denticulates	17	36	47	10
Various retouched tools	56	168	173	32
Total	99	281	273	50
Total tools	246	769	501	113
Bones	150	41	4	23
Teeth	44	11	1	7
Horns	2	2		2
Total	196	54	5	32
Total tools and fauna	442	823	506	145

Inventory of the artefacts and bones from the four archaeological levels of Simbiro III.

Remarks on the lithic assemblages (Figs. 9-11)

Tools on pebble: there is a significant number of tools on pebble. Of these, some 65% is made up of polyhedrons, including those with several working edges. There are also heavy end-scrapers (one of which is a double rabot).

Handaxes and cleavers: there are only a few examples in this group (3.5%). Three of the four artefacts are cleavers with parallel edges. The fourth is a large obsidian archaic handaxe.

Cores: these too are rare (3.5%) and tend to be made from obsidian. One of them is notably large, some 138 mm long.

Débitage: there is a significant number of unmodified and utilized flakes (23%). If we were to add the group of tools on flake, the total reaches 67%, some two thirds of the whole lithic assemblage.

Tools on flake: these make up 44% of the whole. The high percentage mainly thanks to an abundance of tools with fairly insignificant retouch. However, there are also numerous denticulates, as well as a fair number of notches and side-scrapers.

There is a high percentage of obsidian (54%), when compared to the other types of volcanic rock. Of the tools on flake, 86% are made from obsidian,

whereas 38% of the débitage and only 25% of the cores are on obsidian.

There are a few characteristics worthy of note: the handaxes and cleavers make up only 15.5% of the total number of tools on pebble. However, it should be borne in mind that when the limited area of excavation is taken into account, this weighs heavily on any results.

There is a significant number, some twenty or so, of large retouched obsidian flakes, about 110 mm to 150 mm long. Their average dimensions are 126 mm by 90 mm by 47 mm. They appear to have been worked obliquely to the morphological axis of the primary flake. These flakes have a thick trihedral section. The outline is oval shaped. The upper face of the flake presents the negative scars of large discoidal removals. The edges have been roughly denticulated (Oussedik 1976a, b). Some of these flakes have a notch with signs of use-wear.

The faunal remains are well preserved and make up 22% of the finds recorded. They include fragments of bone and teeth of horses (mandible), hippopotamus, *Bovidae* and a few rare antelope horns.

Excavation of Level C

Level C overlies Level D. However, on the upper slopes of the site a process of erosion has resulted in Level C eating into Level D. This is not an occupation layer. The artefacts are dispersed within a deposit of volcanic ash mixed with clays (some 0.8 m thick). The finds record is mainly made up of obsidian flakes. The excavation concentrated on only the upper part of this layer. A significant number of the tools

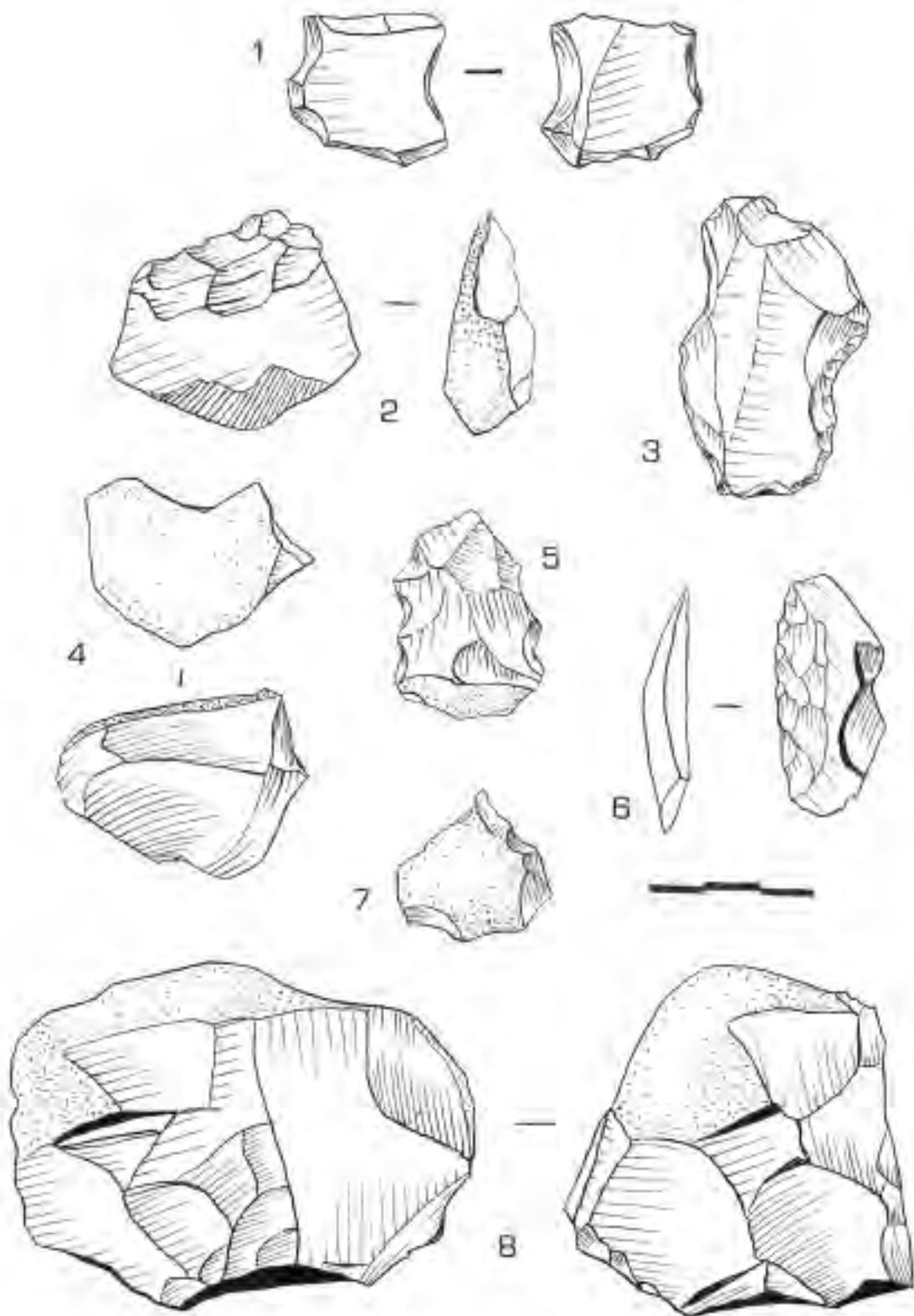


Fig. 9. Simbiro III. Lithic industry of the Acheulian Level A. 2: flake with inverse retouch; 4: centripetal core; 6: straight simple side-scraper; 7: borer; 8: double rabot. Lithic industry of the Acheulian Level B. 1, 3: notched flakes; 5: utilized flake. 1-7: obsidian; 8: basalt. Drawings by A. Berthelet (1, 5, 7) and J. Chavaillon (2, 3, 4, 6, 8)

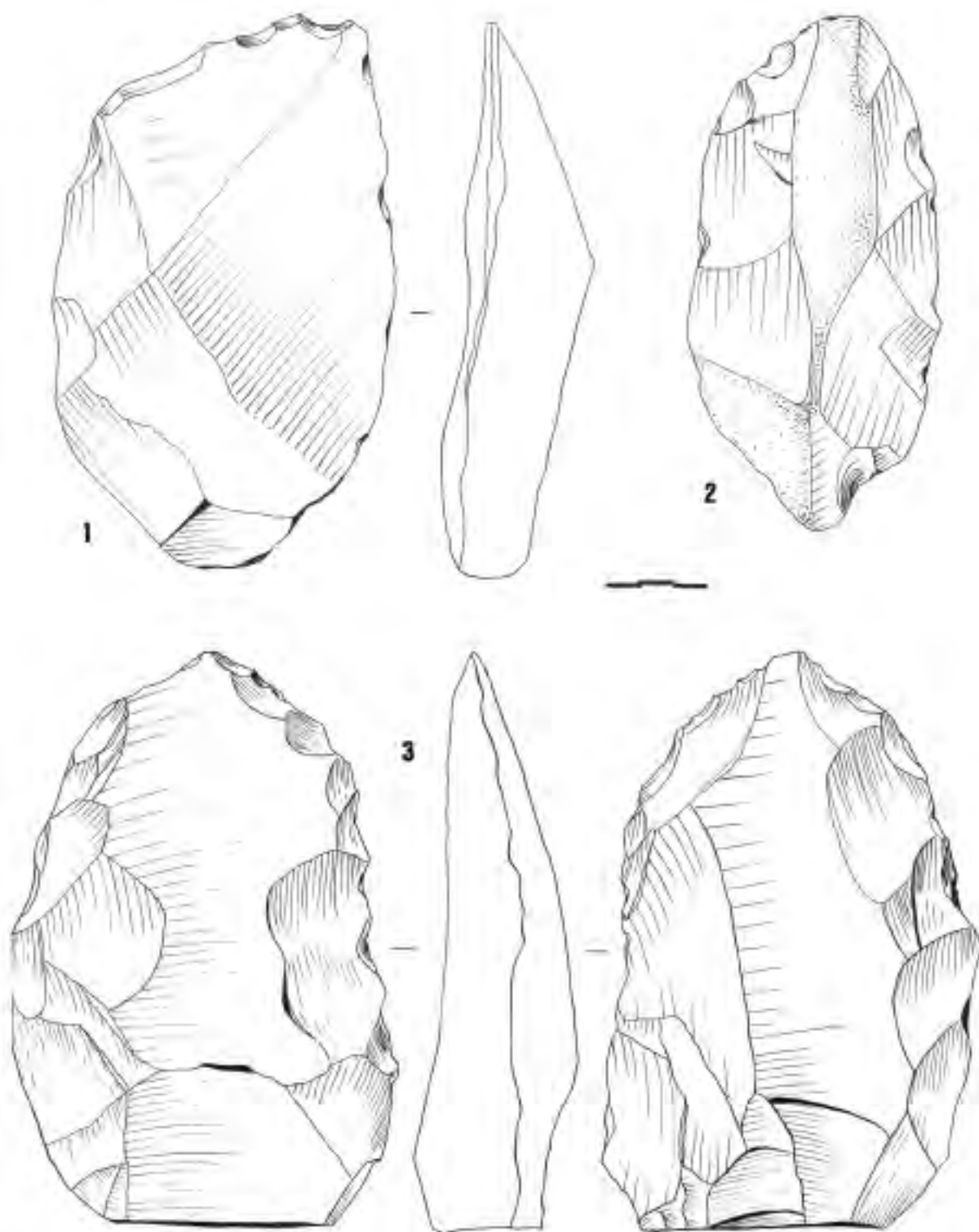


Fig. 10. Simbiro III. Lithic industry of the Acheulian Level B. 1: cleaver with convergent edges; 2, 3: handaxes. Basalt. Drawings by A. Berthelet (1, 2) and J. Chavaillon (3)

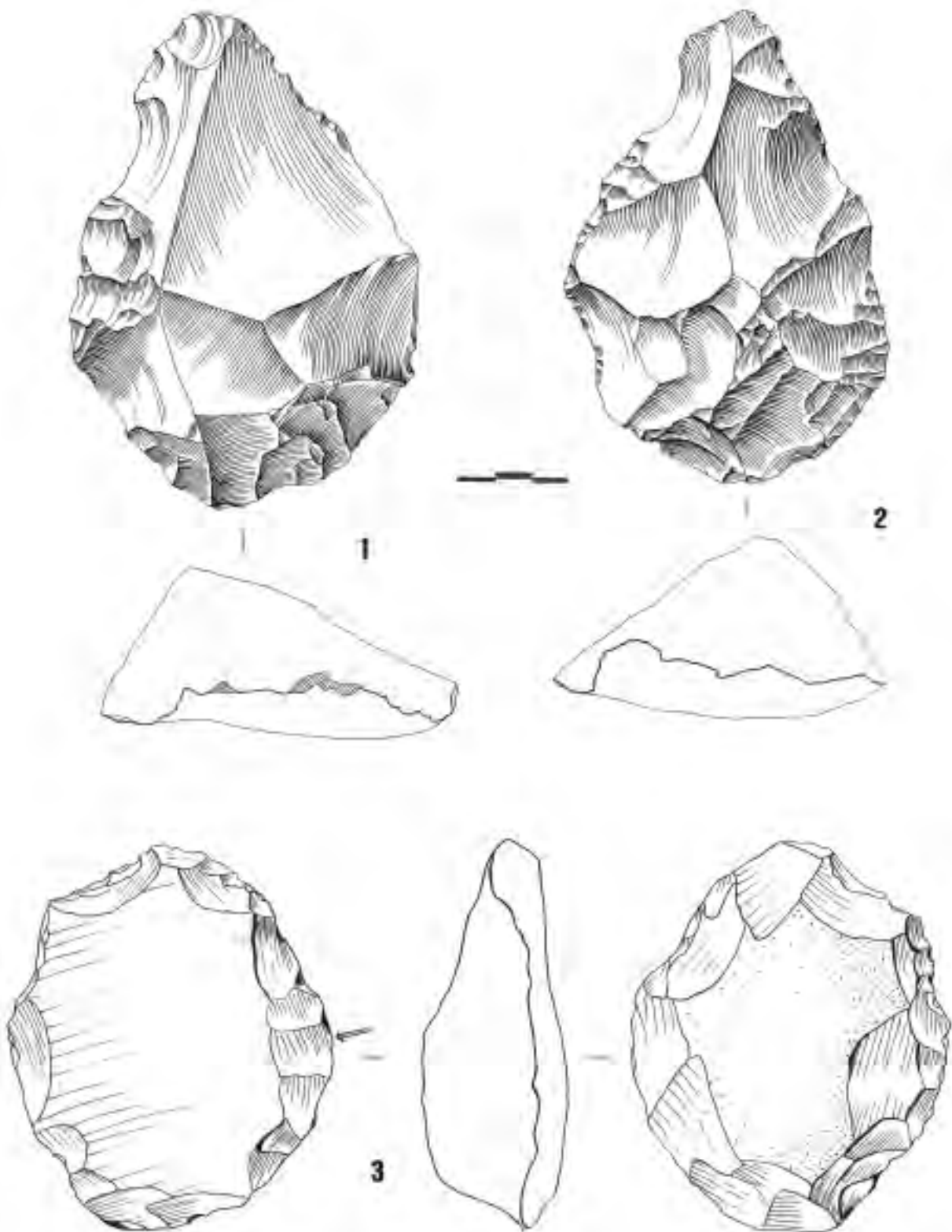


Fig. 11. Simbiro III. Lithic industry of the Acheulian Level B. 3: bifacial side-scraper. Lithic industry of the Acheulian Level D. 1, 2: retouched flakes with trihedral section. Obsidian. Drawings by C. Chavaillon (1, 2) and A. Berthelet (3)



Fig. 12. Simbiro III. Acheulian level. Excavation and stratigraphy. *Top*: archaeological Level B (*locality 2a*) during excavation; fluvial gravel, sands and sandy clay. *Bottom*: archaeological Level C (*locality 2b*); accumulation of flakes, handaxes and other obsidian tools.

were seen to lie obliquely or even vertically in the level. This gives weight to the idea that there might have been a landslide on an archaeological level.

The surface area of the excavation was limited to only a few square metres, dug to a depth of some twenty to thirty centimetres.

Remarks

Percussion material: These are nothing more than broken obsidian pebbles.

Tools on pebble: They are only three.

Handaxes and cleavers: These make up only 3.5% of the total number of lithic artefacts, but this does not take away from the fact that they make up 94% of the total number of tools on pebble/handaxes. Bearing in mind M.D. Leakey's index, the overwhelming proportion of this type of tool would unreservedly classify Level C as Acheulian. Two thirds of this small group are obsidian archaic handaxes or proto-handaxes. They range in length between 60 mm and 110 mm.

Cores: These are rare, and worked from obsidian.

Débitage: There is an abundance of flakes, some 90% of the total, all of which are on obsidian. The unmodified flakes, or those with signs of use-wear, make up only 35% of the whole. There are eighteen blades and four bladelets that are worthy of note. One denticulate has a faceted butt.

Tools on flake: They are very numerous. The 273 objects make up 55% of the whole; all but three of the artefacts are made from obsidian. The three exceptions are an end-scraper, a notched tool and a retouched flake. There are numerous denticulates as well as notches, end-scrapers and side-scrapers. Three awls are worth noting.

Apart from the fact that there is an almost universal use of obsidian, the débitage shows various evolved manufacturing characteristics, though some archaic traits are still distinguishable on a few handaxes.

The very poorly represented faunal remains consist of four bone fragments and a tooth.

Excavation of Level B

A sandy layer divides Level C from Level B. The latter is made up of coarse gravel laminates within a sandy sediment. Lithics and faunal remains are very frequent.

Level B was recorded over some fifteen square metres, twelve of which were excavated. This was where the 1973 excavation uncovered the remains of a large *Pelorovis*.

Level B is the richest archaeological layer thus far uncovered at Simbiro III, with 769 lithic artefacts and 54 faunal remains recovered from the deposit. Obsidian and other volcanic rocks make up 81% of the raw material used. The artefacts tend to be smoothed. Apart from obsidian there is also basalt, a considerable amount of volcanic tuff and vuggular lava.

Remarks

Percussion material: most of these are worked from other types of volcanic rocks than obsidian. They make up 15% of the total number of artefacts. There are numerous broken pebbles with from one to three fractures. Many of these show signs of utilization with evidence of impact. There are only a few (6%) "real" hammerstones (active or passive).

Tools on pebble: these are infrequent when compared to Level D, making up only 8.5% of the whole. There are many choppers within the group (38%), especially lateral choppers and choppers with a peripheral cutting edge. The manufacture of the latter involves a very evolved process, and is typical of an Acheulian occupation level. The polyhedrons make up 25% and tend to be those with a primary cutting

edge, prismatic, and particularly spherical polyhedrons. The latter provide further evidence of an evolved manufacturing technique. Two thirds of the end-scrapers on pebbles are rabots.

Handaxes and cleavers: about a half of the group of 144 artefacts (18.5%) is made up of cleavers. The handaxes tend to be large. Only a few (12.5%) are worked from obsidian. These handaxes are leaf – or teardrop-shaped and either only partially worked or three-sided. The cleavers have a fine cutting edge (cleavers with convergent edges). Two of them have been worked from a Kombewa flake. There are numerous cleavers with parallel edges (U-shaped) as well as those with divergent edges (V-shaped). The latter are more archaic.

Cores: there are only 17 rare finds in this group (2.2%), and they tend to be worked from obsidian. They tend to be unipolar cores, though there are some discoid examples.

Débitage: unmodified and retouched flakes make up 56% of the total. Only a quarter are on obsidian.

Tools on flake: of the 281 objects, there is a slight predominance of side-scrapers and denticulates. They include simple straight side-scrapers, simple convex side-scrapers, transversal side-scrapers and above all side-scrapers with bifacial retouch. Some large scrapers (100 mm to 150 mm) stand out as characteristic of the Acheulian. There are very frequent notches, as well as a few examples of awls and perforators.

As a group, handaxes and cleavers represent 68% when combined with the tools on pebble group.

When the various rock types are considered together, the proportion of obsidian used (19%) is low. This singles out Simbiro III as the site where this type of rock has been used the least.

On Simbiro III the lithic artefacts worked from tuff and basalt are smoothed, unlike the obsidian tools which have remained sharp. This could imply that the layer has been reworked. However, the presence of a huge *Pelorovis* skull appears to counteract this hypothesis, leading us to believe that there may have been some kind of alteration of the natural state of the tuff and basalt.

The faunal remains are made up of 41 bones (some of which are fractured), 11 tooth fragments and 2 antelope horns. The identified species include hippopotamus, antelope, *Bovidae* and *Equidae* (*Stylohipparion*). The *Pelorovis* skull is an unusual and intriguing find. What remains of the evidence consists of the base of the skull, one whole horn and a part of the other (1.2 m). Its horn span must have been some two metres. *Pelorovis oldovayensis* is known to have existed in Ethiopia in the Omo Valley nearly two million years ago, in Tanzania at Olduvai Gorge (Bed II) earlier than 1.2 Ma, and in a smaller version in Kenya at East Rudolf at about the same time.

Excavation of Level A

This is the latest of the four Levels excavated at Simbiro III. Level A was excavated over a limited area of only a few square metres, but a significant number (44%) of faunal remains were recovered as well as lithic artefacts. The lithic assemblage is made up of 246 artefacts.

Remarks

Percussion material: percussion tools are particularly frequent (20%). There are many “active” hammerstones, but still more broken pebbles, with at least one fracture.

Tools on pebble: these are mainly choppers and rabots.

Handaxes and cleavers: there are only a very few of these, one handaxe and two small obsidian bifacial tools.

Cores: these tend to be unipolar or discoid. They are all worked from obsidian.

Débitage: some 70% of the group is made up of unmodified and retouched flakes. This is similar to the situation in Level D. The débitage tends to be on basalt or tuff, whereas two thirds of the tools on flake are on obsidian.

Tools on flake: these are mainly denticulates. Notches are less frequent, unlike the side-scrapers which are fairly abundant. These include simple straight side-scrapers, simple convex and déjetés side-scrapers. There are a few awls and perforators.

In conclusion, obsidian is preferred for the production of tools on flake such as side-scrapers, denticulates and awls. Basalt and tuff tend to be used for tools on pebble.

There is an abundance of animal bones. The 196 finds make up 44% of the total. Teeth account for 22%. There are only two horn fragments.

Overall conclusions

Various conclusions can be drawn from the excavation of these four levels. Constant evolution in the manufacture of the lithic assemblage can be seen. The variety in the choice of raw material has also been noted, with the choice of obsidian over basalt or volcanic tuff dependent upon the final product required.

The fact that the surface area excavated is not constant in the four levels has influenced the number of finds retrieved per level, and creates a few misgivings as to the value of any statistical analysis of the number of finds from each artefact group. As for the surface area excavated in the various levels, there is a clear difference in the proportion of finds present in each. While the information gleaned from Levels B and C would appear to be valid, this is by no means the case for Levels A and D.

There are various typological characteristics that are worth of noting:

- Tools on pebble (choppers, polyhedrons, etc.) are rare, apart from the 20% in Level D.
- Handaxes are always present. They are often archaic and are similar to a type of “proto-handaxe”. They are particularly frequent in Level B.
- There is an abundance and variety of cleavers (especially in Level B).
- There are noticeably few cores. Unexpectedly, they are less frequent in Level C, where this contrasts with an abundance of débitage (90%). There are simple, unipolar and discoid cores.
- There is an abundance of débitage throughout the deposits, this is especially true of Level C. Here, various evolved characteristics have been distinguished such as the production of blades and of some bladelets.
- The tools on flake tend to be denticulates or notches. Side-scrapers are fairly common. The evolved examples such as awls are found in the upper Levels. The large flakes with a trihedral section show signs of peripheral retouch and their edges tend to be either denticulate or notched.

Faunal remains are abundant in Level A, less so in Level B and almost non-existent in Level C. They include hippopotamus, *Equidae*, *Bovidae* and antelopes.

All four Levels seem to date unreservedly to the Early/Middle Acheulian, are probably more evolved than Garba XII, and are very similar to the Middle Acheulian of Gombore II.

Gombore II

Excavation at the Gombore II site (Figs. 13-20) began in 1970. Further excavation took place in 1973, 1974 and 1975. A second cycle of excavation got underway in 1993 and 1995. Two levels have been identified. The earliest and more important level overlies Tuff B. This level is particularly extensive, anything up to a thousand square metres. It has been dated to the Middle Acheulian (about 0.80 Ma). Excavation in four different spots has permitted a balanced overall view of the archaeological situation. The first, *local-*

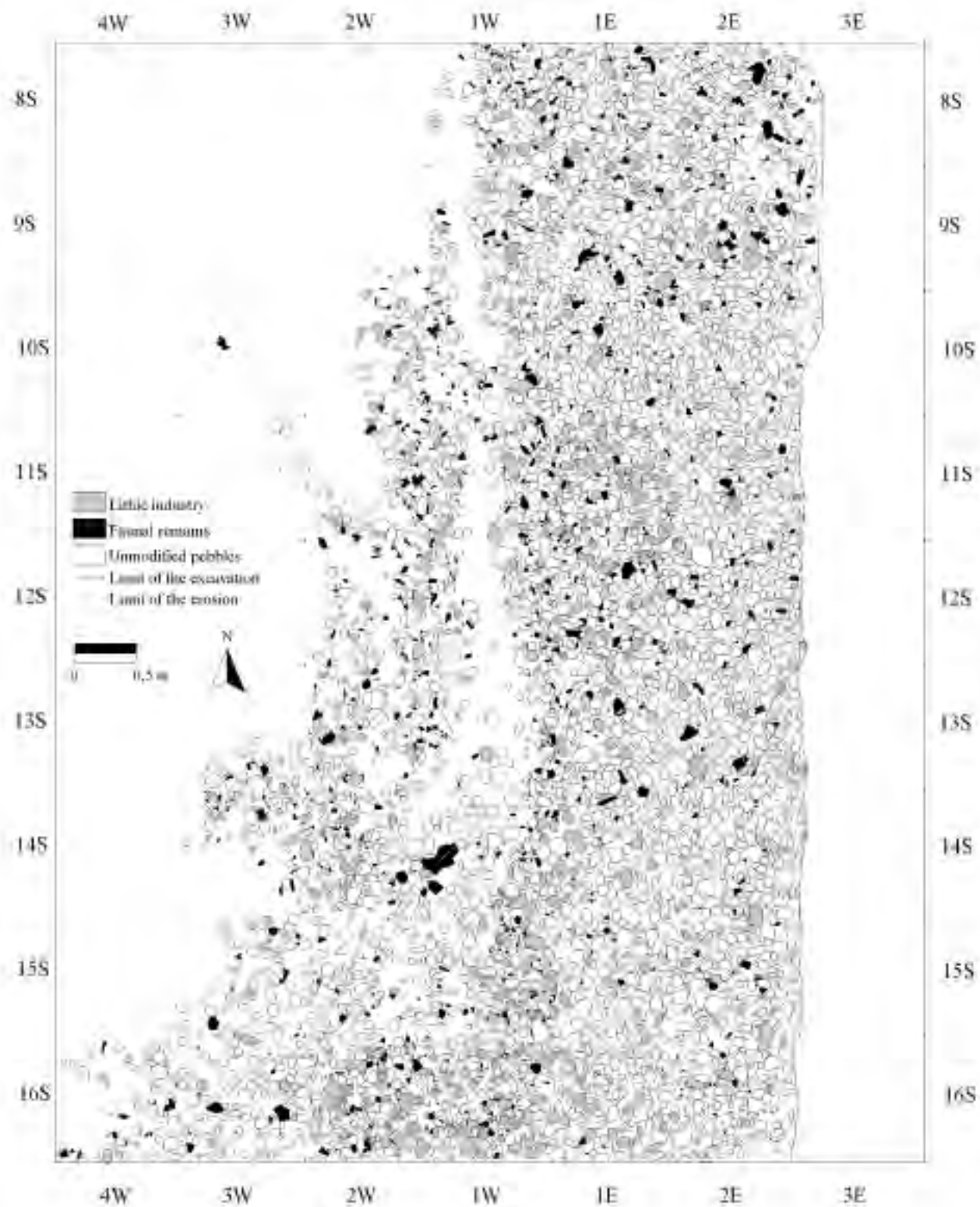


Fig. 13. Plan of the excavation of the Middle Acheulian site of Gombore II-1.

(Original plan by C. Brahim and J. Gire, digital map by R. Gallotti)



Fig. 14. Gombore II, *locality 1*: Middle Acheulian. *Top*: the Acheulian level. To the right the area where a parietal bone of *Homo cf. erectus* was found *in situ*. *Bottom*: the two Acheulian levels divided by clayey and sandy strata.

ity 1, lies on the gravel bed of the Awash River. The stratigraphy has been heavily disturbed by the seasonal flood waters of the Awash.

The two significant archaeological deposits sandwich a layer of river sands mixed with volcanic tuff. They signify two phases of human activity in the area that are closely related chronologically. These two phases of activity can be combined. At the other three sites (*localities 3, 4 and 5*) there is a concentration of lithics and faunal remains. This could imply a repetitive and reasonably continuous occupation of the area. The substratum is a sandy clay, with a few coarse gravel and pebble inclusions. It is probable that the archaeological deposit was formed by sequential phases of activity on two Acheulian settlement sites.

The upper settlement layer overlies the site of *locality 1* by a few metres. At the time of its discovery, the site was interpreted as a hippopotamus butchery site (*locality 2*) and since then it maintained this name. The layer stretches over some 26 square metres and can be dated to about 0.70 Ma (the Brunhes-Matuyama boundary). The sequence lies within the “Tuff D” complex.

Of those who took part in the 1970 to 1995 excavations, certain names cannot be left unmentioned: Arlette Berthelet, Jean-Luc Boisaubert, Claude Brahimi, Grazia Maria Bulgarelli-Piperno, Jean Chavaillon, Nicole Chavaillon, Jean Gire, Françoise Hivernel, Francis Hours, Sami Karkabi, Ouardia Oussedik and Marcello Piperno, with the help of Kebede Bogale and Dr. Solomon Degefa. The lithic finds recovered on *locality 3* between 1973 and 1974 were originally partly analysed (Brahimi 1976a, b) before being taken in hand again by A. Berthelet and J. Chavaillon as part of a broader analysis.

The stratigraphy

The Gombore II site occupies a vast area. The Acheulian occupation layer seals a bed of sandy clays. In certain points (*locality 1*) the occupation layer is sandwiched within a sequence of coarse gravels that have been interpreted as a pebble bank of the River Awash. These layers of clay with sandy and gravel inclusions have partially eroded the underlying Tuff B complex. The same sequence can be found beneath Level D at Garba XII. In a few points the Tuff B sequence is covered by a deposit of volcanic matter that has been defined, rightly or wrongly, as Tuff C. The volcanic deposit varies in thickness and is very uncontaminated. This layer in the Gombore II deposit is between 0.2 m and 0.5 m thick.

The tuff deposit is overlain by layers of clay sealed by a significant laminated sandy layer. The whole archaeological sequence of Gombore II is sealed by a layer of tuffaceous levels (annotated Tuff D). Within this final sequence, the butchered carcasses of hippopotamus came to light covered by a layer with frequent pumice inclusions.

Acheulian localities 1, 3, 4 and 5

In the upper part of the final archaeological sequence of the *locality 1* deposit, as in *localities 3 and 5*, there is a particularly dense concentration of archaeological material. A few hundred lithic artefacts and faunal remains were recovered from *locality 1*, whereas the surface area excavated on *localities 3, 4 and 5* was somewhat more limited. The finds recovered from the latter sites include 666 finds from *locality 1* (only 1971 and 1976), 742 finds from *locality 3*, 134 finds from *locality 4* and 340 finds from *locality 5*. The proportion of lithic finds varies between 30% and 40% of the total (bones and lithics combined). *Locality 1* strikes an exception to the rule, here the lithic finds account for 68% of the total.

The Acheulians exploited similar quantities of each type of raw material, be it basalt, tuff or obsidian. The percentage of the latter varies from one locality to the other, ranging between 36% and 47%. There is a predominance of obsidian amongst the flakes and tools on flake. This is especially the case for the end-scrapers, 87% of which are from obsidian cores. The cleavers are worked from basalt, and 85% of the han-

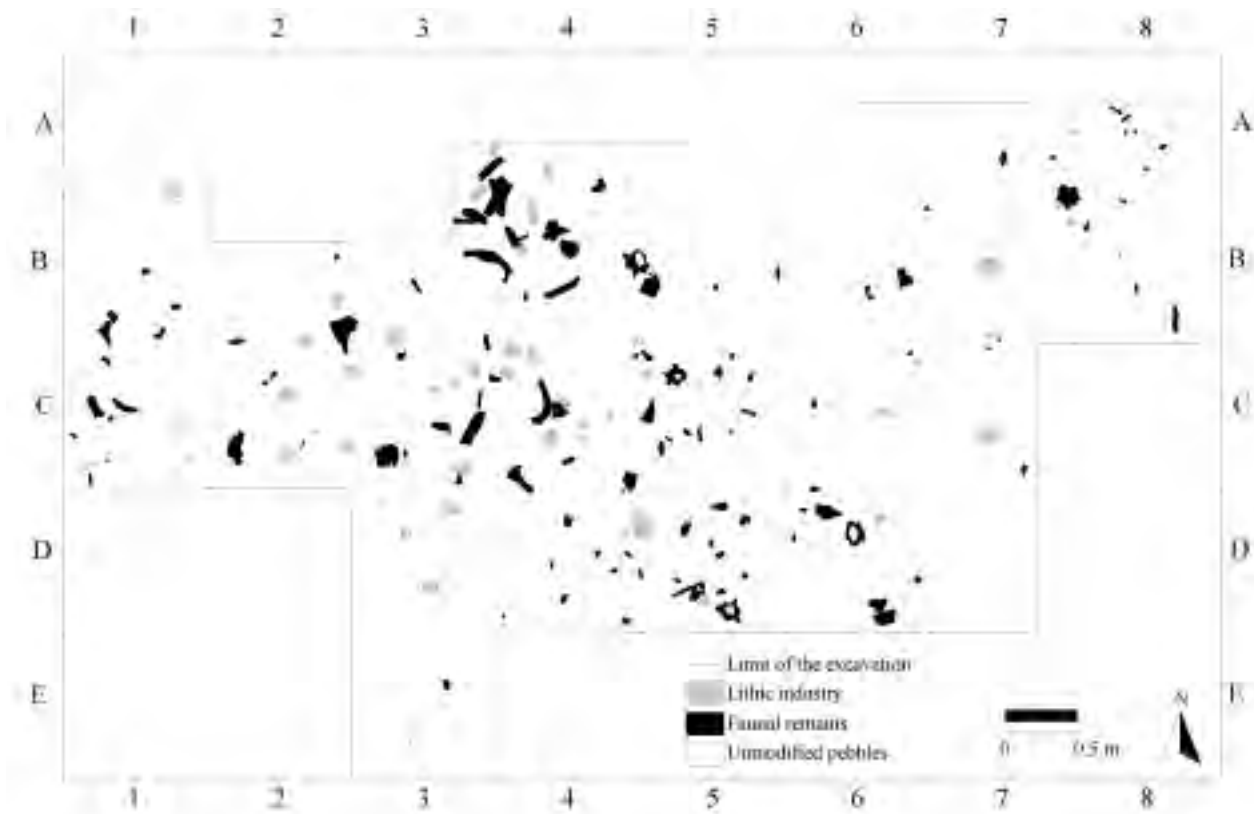


Fig. 15. Plan of the excavation (1993, 1995) of the Middle Acheulian site of Gombore II-2 "Butchering site".

(Original plan by J.-L. Boisaubert, digital map by R. Gallotti)

Types	Loc. 1	Loc. 3	Loc. 4	Loc. 5	Total
Anvils	4	4	3	3	14
Battered pebbles	16				16
Broken pebbles	224	111	16	29	380
Trimmed pebbles	13				13
Choppers	16	20	10	14	60
Polyhedrons	10	26	1	2	39
Bolas	1				1
Rabots - Heavy end-scrapers	6		3	2	11
Broken tools on pebble			2	1	3
Handaxes	69	63	11	31	174
Cleavers	1	12		1	14
Picks			1	1	2
Cores	9	24	2	4	39
Unmodified flakes	148	227	50	73	498
Utilized flakes	2	123	7	8	140
Side-scrapers	9	36	10	18	73
End-scrapers	3	4	1	1	9
Awls	1	3	1	1	6
Flakes with inverse retouch				1	1
Backed knives			1	3	4
Notches	3		2	1	6
Denticulates	12		5	6	23
Small bifacial tools	8	14			22
Retouched flakes	111	73	6	10	200
Others		2		1	3
Debris			2		2
Total	666	742	134	211	1753

Inventory of the localities 1, 3, 4 and 5.



Fig. 16. Gombore II, *locality 2*. The Middle Acheulian “Butchering site”. *Top*: general view of the excavations in 1993 and 1995. *Middle*: hippopotamus rib and stone tools with a bola. *Bottom*: detail of hippopotamus bones: fragments of ribs, scapula and vertebra.

daxes are worked from obsidian. The handaxes with a twisted edge and the miniaturised handaxes are worked from obsidian.

Brief remarks on the lithic assemblages of Gombore II, with particular reference to locality 5

Tools on pebble: Proportionately this group is very important (33%). Most of the tools are choppers, apart from two spherical polyhedrons. There are 14 choppers. These include:

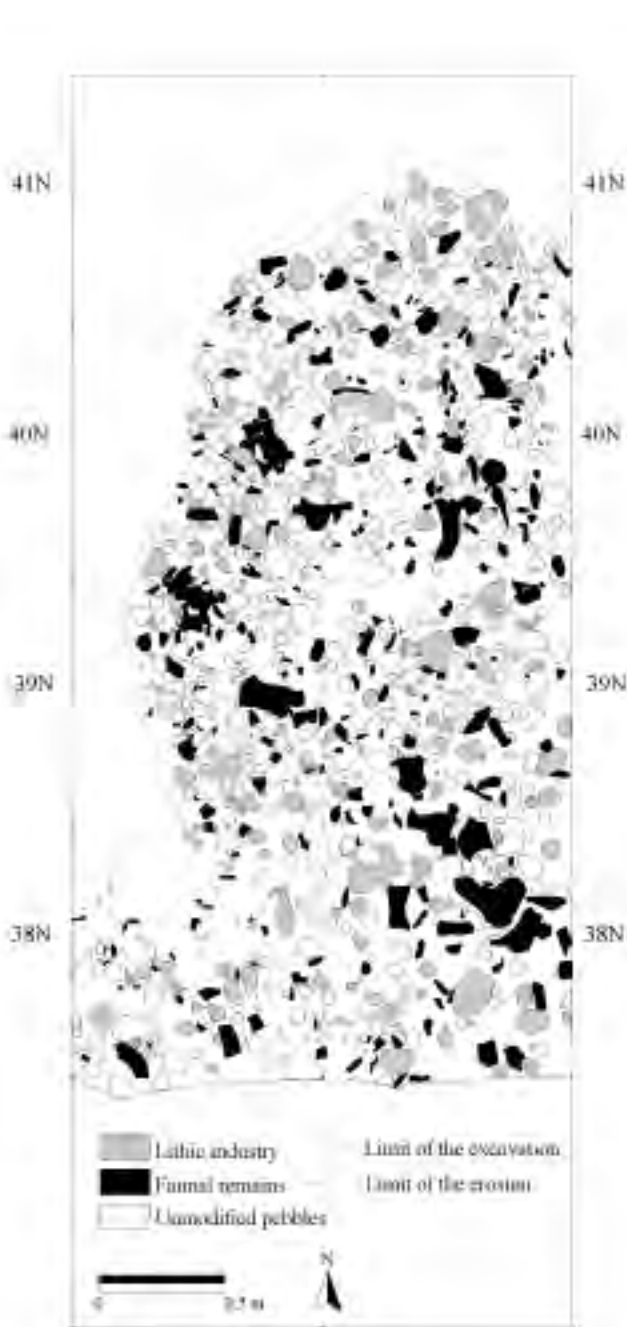


Fig. 17. Plan of the excavation of the Middle Acheulian site of Gombore II-3.
(Original plan by C. Brahimi, digital map by R. Gallotti)

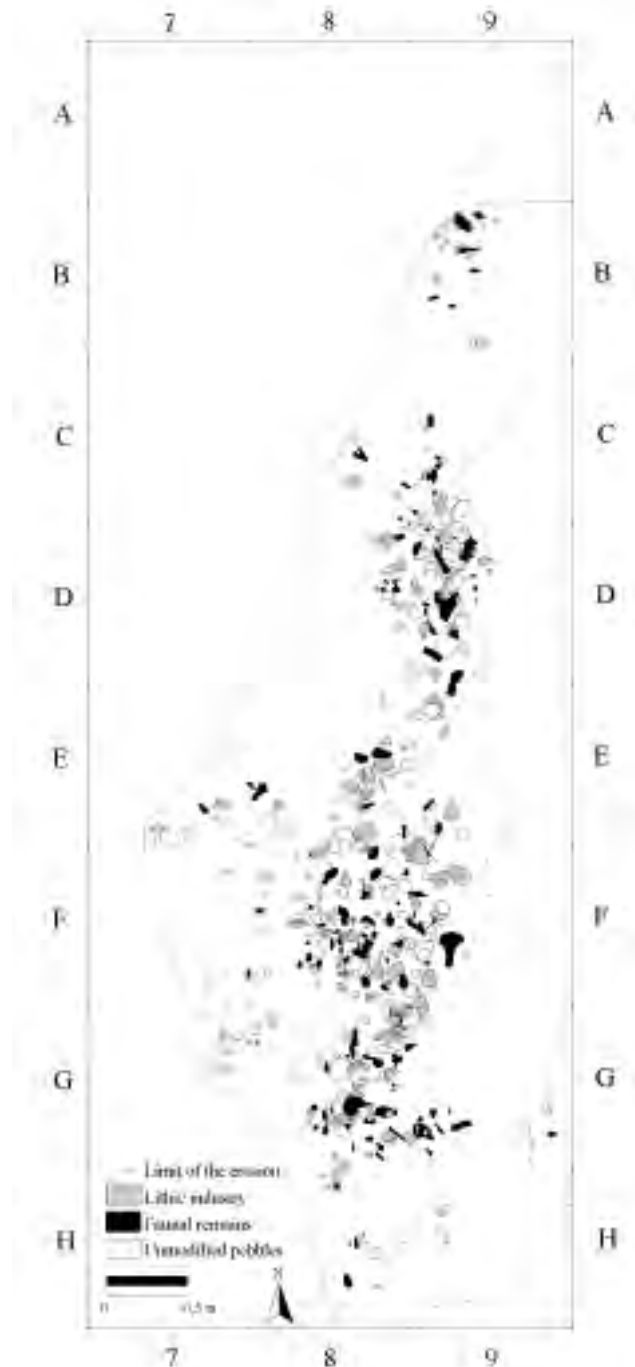


Fig. 18. Plan of the excavation of the Middle Acheulian site of Gombore II-4.
(Original plan by J.-L. Boisauvert, digital map by R. Gallotti)

- unifacial lateral choppers	3
- bifacial lateral choppers	5
- unifacial distal choppers	5
- unifacial double choppers	1

The group includes a small bifacial obsidian lateral chopper that was clearly originally a core. In its secondary phase of use it was worked into a pebble tool with a cutting edge at an angle of 70°. Two of the bifacial lateral choppers have been worked with a single removal. The cutting edge has an angle of between 50° and 75°.

One very smoothed notched pebble tool some 31 mm long must be noted.

Two *rabots* are slightly smoothed. One of these has been worked from what was originally a core. They were elaborated from four or five abrupt points of percussion. The convex cutting edge has an angle of 90°.

The *handaxes* are between 50 mm and 130 mm long, and most tend to be between 60 mm and 80 mm long. The longest basalt biface is 130 mm long. These tools tend to be either flat or very flat; their faces and ridges are not smoothed. For some 70% of them, the thickest part of the tool lies at the mid-point. This characteristic suggests an intentional desire for symmetry. The repetition of certain aspects, leading to a virtual standardisation of the products, implies that the Gombore II Acheulian paid much attention to their trimming techniques. This is further confirmed when one considers the frequency with which the edge has been “twisted”. This “twisted” edge tends to be found on the left side rather than the right. There is a predominance of cordiform and oval shapes. There are also elliptical shapes that are similar to the twisted handaxes. The cutting edge tends to be steep, not very sinuous, and almost straight. Sometimes, on 27% of the examples, the edge is decidedly convex. The angle of the edge lies between 55° and 85°. The Acheulian were very adept at the so-called Kombewa technique of flint knapping. The technique was used to work obsidian handaxes. One edge of these tools is markedly sinuous or “twisted”. One particular characteristic of the mainly obsidian handaxes from Gombore II is worth noting. This involves the way in which the sides of the tool have been worked. Here, very fine flakes have been trimmed from the points of percussion leaving a sort of herringbone pattern along the central ridge. This characteristic is also to be found on the handaxes from the Haroresa sites north of Lake Langano (Chavaillon 1979a).

There are not many *cleavers* within the group of handaxes. One of them has straight parallel sides with an oblique cutting edge. The angle lies between 40° and 45° and shows signs of utilization.

Cores are rare. They are on obsidian, either unipolar or polyhedral.

Débitage (unmodified flakes and tools on flake), is particularly abundant (58%), in spite of the fact that cores represent only 2%. The “Kombewa” technique was known and used. Over half of the whole unmodified and retouched flakes are either “long” or “very long”. Some 14% of this group of flakes are very thick.

The 144 *tools on flake* from *localities 1, 3, 4 and 5* include frequent (51%) side-scrapers of various types (see table below). These tend to be simple convex side-scrapers, and convergent convex side-scrapers. There are a few less transverse and bifacial (or otherwise alternate) side-scrapers. Some 62% have a convex retouched edge, and 37.5% are double side-scrapers.

Taking the lithic assemblage as a whole, denticulates and notches are well represented. One of these notches is inverse. There are only 4 backed knives, one of which has a dihedral butt. Some of the 22 small obsidian bifacial tools are less than 30 mm long and they often show a twisted ridge.

It should be noted that the apparently high number of undifferentiated retouched flakes is due to an on-site spot analysis of the finds which as yet has not been checked with any greater precision.

Types of side-scrapers	Loc. 1	Loc. 3	Loc. 4	Loc. 5	Total
Straight simple		5	1	1	7
Convex simple	4	11	3	2	20
Double straight		1		1	2
Double straight-convex				1	1
Double straight-concave			2		2
Double biconvex		1	1		2
Convergent straight-convex		4			4
Convergent convex	3	10		2	15
Déjeté				1	1
Straight transverse	1		1	1	3
Convex transverse			1	2	3
Inverse			1	2	3
Bifacially retouched	1		1	2	4
With alternate retouch				2	2
Undifferentiated		4			4
Total	9	36	11	17	73

Types of side-scrapers at Gombore II.

Hominids

A fragment of the left parietal of the skull of a fairly young hominid was found in 1974 in the upper levels of the Acheulian deposit in *locality 1*. Yves Coppens (Chavaillon *et al.* 1974; Chavaillon and Coppens 1975, 1986) has identified this skull fragment as *Homo erectus*. The bone was encrusted with a sandy coating and was heavily mineralised. The lithic assemblage associated with the parietal fragment can be dated to the Middle Acheulian. It includes handaxes and cleavers as well as a selection of obsidian tools on flake (side-scrapers, end-scrapers and many unmodified flakes). In the following year, 1975, a fragment of human cheek bone was recovered from the section of a small watercourse crossing *locality 1*. This could imply that the bone fragment had been washed downstream and had originally lain within the same archaeological layer as that of the previous skull fragment. The anatomical characteristics and their fossilised state add weight to this hypothesis.

Acheulian locality 2

In 1974 a trial trench cut through *locality 2* provided evidence of a possible hippopotamus butchery site. *Locality 2* lies close by *locality 1* but overlaps it by some six metres. The occupation layer lies sandwiched within the volcanic sediments of Tuff D and has been dated to about 0.70 Ma. Excavation in this area resumed in 1993 and 1995. The fossilised remains of the shattered bones of two hippopotamus were brought to light together with a few bones of *Equidae* and 51 artefacts. The scattered bone fragments include shoulder blades, leg bones, rib bones, vertebrae and three broken teeth.

Some 61% of the lithic assemblage is worked from basalt. There are a few artefacts made from trachyte, welded ignimbrite and vuggy lava and not very much obsidian (10%). The lithic assemblage of tools on pebble breaks down into various sub-groups, including hammerstones, battered and broken pebbles, choppers, polyhedrons, rounded stones like bolas, one rabot and one handaxe. Débitage includes rare cores, some flakes (whole or broken) and a few tools on flake.

The percussion material makes up 27% of the artefacts and is strongly related to activities such as grinding large bones. The relatively high number of broken pebbles could well indicate how much effort was needed to crush these bones or maybe it is just a sign of bad raw material quality. Evidence that these

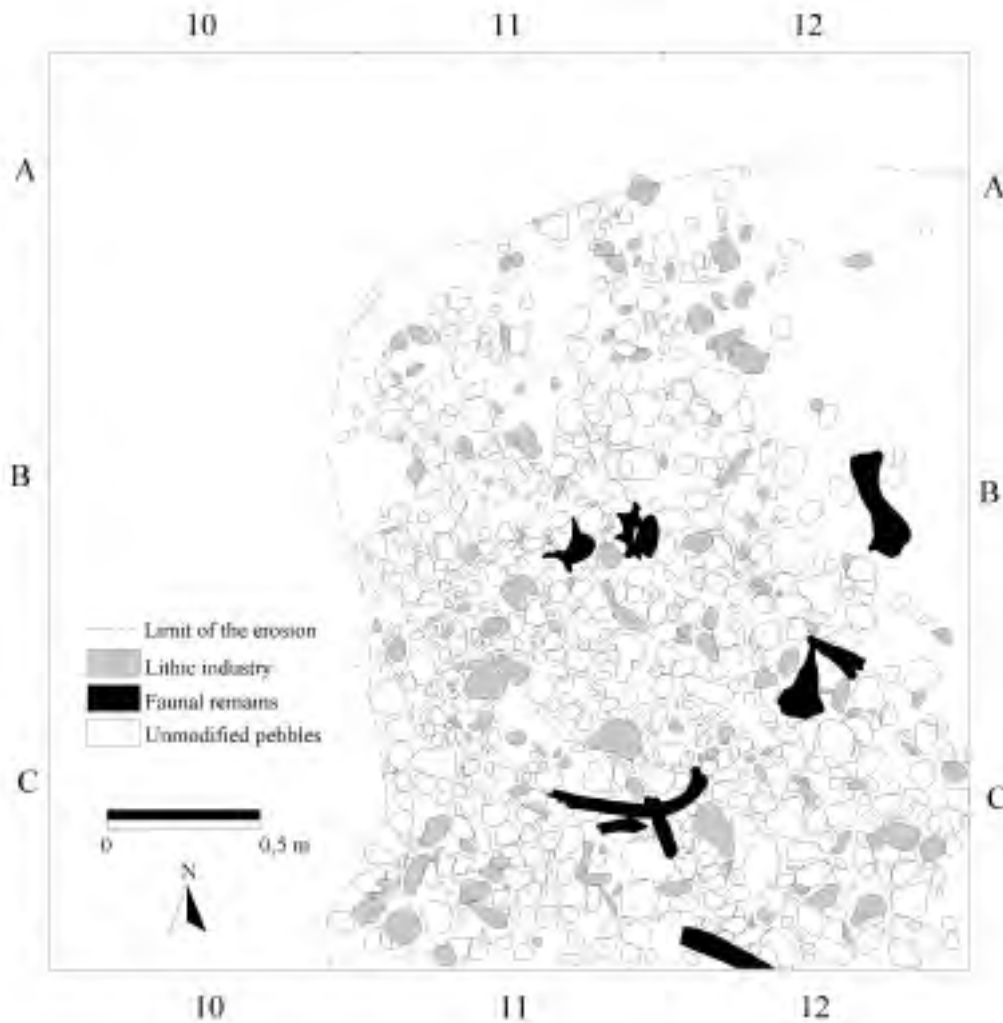


Fig. 19. Plan of the excavation of the Middle Acheulian site of Gombore II-5.

Only largest faunal remains have been highlighted. (Original plan by J.-L. Boisauvert, digital map by R. Gallotti)

Types	Total
Anvils	3
Broken pebbles	11
Choppers	6
Polyhedrons and bolas	3
Heavy end-scrapers and rabots	3
Notches on pebbles	31
Handaxes	1
Cores	4
Unmodified flakes	9
Utilized flakes	2
Various tools on flake	6
Debris	2
The lithic assemblage of Gombore II, locality 2.	

tools on pebble were used as crushers can be seen along the edges, the ridges and the surfaces of the tools. One of the basalt hammerstones, some 107 mm long, has two broad pits on one side, a clear sign that it was subjected to repeated blows.

Two rounded stones, similar to bolas, were found scattered amongst the bone fragments as well as two spherical polyhedrons lying in a one metre long alignment. The two bola-like objects are similar in size. The one measures 107 mm by 100 mm by 85 mm, the other 107 mm by 102 mm by 86 mm. The small spherical polyhedron has eight removals. A basalt handaxe, some 150 mm long,

was found near one of the bola-like objects. This cordiform handaxe is thick and has a butted base, similar to those named “*butted amygdaloid*” by F. Bordes.



Fig. 20. Gombore II, *localities 4 and 5*. Middle Acheulian. *Top to the left*: the Acheulian level at *locality 5*. *Top to the right*: excavation of *locality 4*. *Bottom to the left*: detail of two handaxes found during excavation of *locality 4*. *Bottom to the right*: detail of one obsidian side-scraper from *locality 4*.

Choppers are well represented. Most of them are bifacial lateral choppers. One of the two is a double chopper, with opposite working edges. All of the cutting edges are fairly sinuous. The angle of the cutting edge lies between 60° and 90°. Amongst the tools on pebbles there is a small obsidian chopper, with a straight steep cutting edge angled at 70°.

As far as the débitage is concerned, it is present in limited quantity. Only three polyhedral cores have been found. One of these was subsequently transformed into a rabot. There are only twelve flakes, whether broken or not, amongst the débitage. The dimensions of the tools on flake range between 31 mm and 90 mm. One side-scraper and a notched tool, both in obsidian, are 31 mm and 33 mm long respectively. There is only one example of a denticulate on basalt, some 90 mm long.

Garba I

The Garba I site was first discovered during a field survey of the Melka Kunture site under the supervision of G. Bailloud who named the site “Godeti” (Bailloud 1966). Given his satisfaction with the finds recovered on the surface, no excavation was carried out. The southern limit of the site has been lost to the waters of a tributary of the Awash flowing into the latter. The water erosion has left a section where it was possible to observe a major sequence of gravel beds in which various handaxes were sticking out of the stratigraphy, mixed with polyhedrons, bolas and bone fragments, suggesting the existence of a living floor, annotated as “Layer B” (Chavaillon 1968, 1973a, b) during the subsequent excavation. This level can be interpreted as an Upper Acheulian occupational horizon with numerous handaxes and cleavers.

Excavation began in 1965 under the supervision of J. Chavaillon, and was to continue until 1975 with the support of N. Chavaillon, J. Gire, F. Hivernel, F. Hours and from 1975 J.-L. Boisubert. Kebede Bogale and Daniel Touaffe, representatives of the Institute of Archaeology and the Ministry of Culture respectively. Both J. Chavaillon and N. Chavaillon carried out the study of the lithic assemblages. An area of approximately 200 square metres was excavated (Fig. 21). A few test pits sunk into the upper slopes provided evidence that the site continues in that direction.

Excavation and stratigraphy

The Garba I site (gully A after Taieb 1974) lies over eighteen metres above the present day level of the Awash. Y. Egels’ 1971 IGN map of the area fixes it at 2031 m above sea level. The same map places the Garba I site 340 metres to the west of the archaeological camp site.

The stratigraphy of the site can be summarised as follows. The underlying fluvial deposits seal a sequence of volcanic layers. The latter are contemporary with a sequence on the Gombore II site which seals the hippopotamus “Butchery site”. A crust of sandy concretions at the top of the sequence seals a series of overlapping laminated fluvial deposits of sand and gravels. The upper part of the sandy crust is mixed with varying degrees of clay with unsorted volcanic ash inclusions. Within the sandy crust, Layer B, a layer of pebbles and gravel, covers a fine gravel bed (Layer C) which in turn overlies a fine layer of sand. Human presence in this narrow channel of an ancient tributary of the Awash can be identified from the high number of tools on pebble, handaxes, cleavers, cores and flakes, not to mention the numerous fragments of animal teeth and bones.

The Garba I site runs parallel to the ancient tributary (Figs. 22-24). The Acheulians settled on the sandy bed of this dried up tributary. The latter would have been some ten metres wide, flowing only occasionally. The finds include lithic assemblages, animal bone debris and evidence of human occupation such

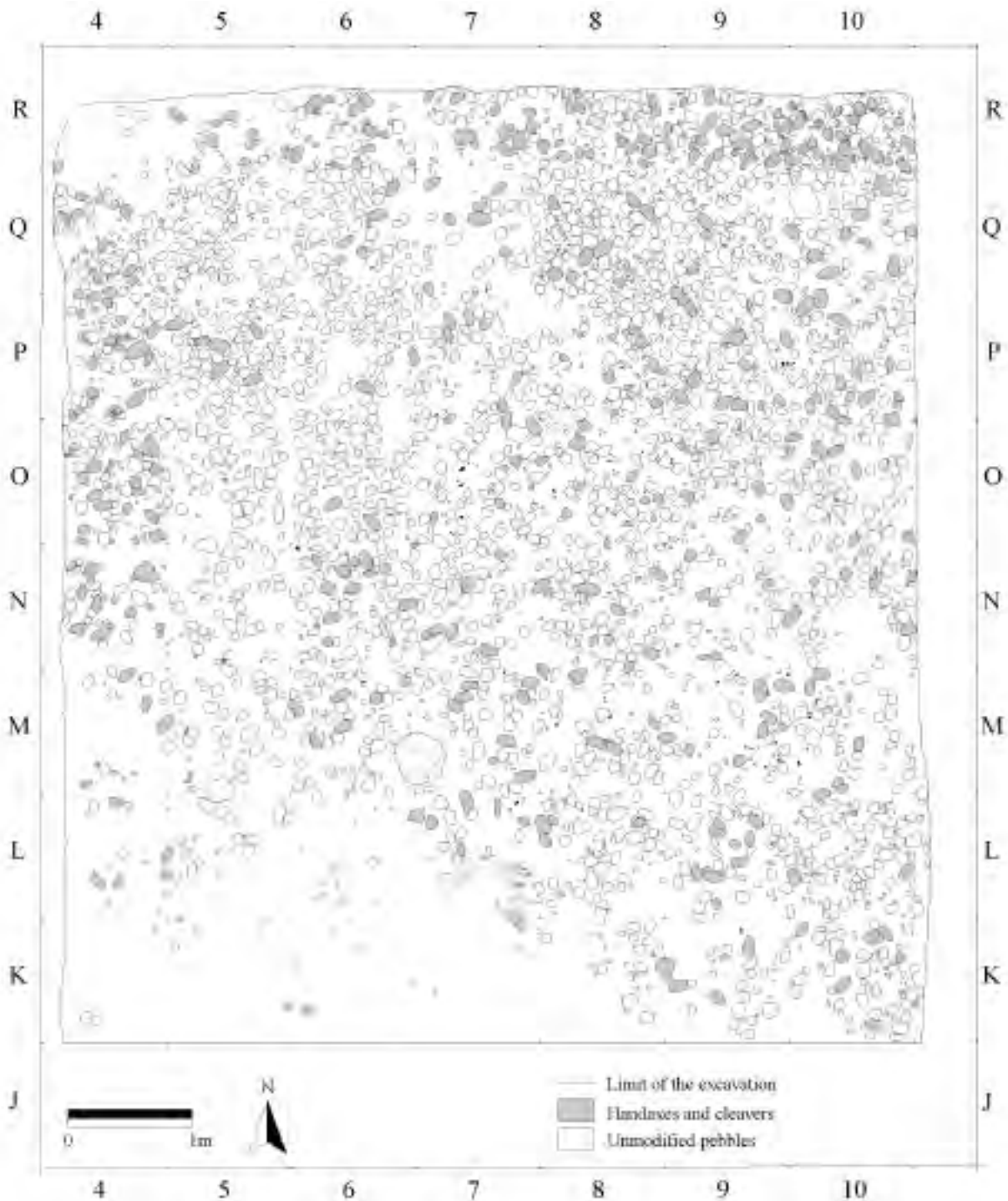


Fig. 21. Plan of the excavation of the Upper Acheulian site of Garba I.

The small faunal remains have not been indicated. (Original plan by J.-L. Boisaubert, digital map by R. Gallotti)

as rough stone blocks, red ochre, etc. Most of the finds lay horizontally on this surface. Various elements suggest that the surface had been subject to a prolonged period of exposure to the elements and was occasionally submerged beneath the waters of the tributary. These elements include the type of patina on the lithic tools (especially those in obsidian), the frequently smoothed upper side of some of the tools (while the lower face shows no such signs) and the fact that the bone fragments have been shattered into tiny pieces. There is no way of proving that the campsite lay only a few metres from the ancient Awash River, or whether the Garba Acheulian had settled further upstream at the source of the tributary.



Fig. 22. Garba I. Upper Acheulian level. *Top to the left*: N/E sector during excavation in 1965. *Top to the right*: excavation of S/E sector. *Bottom*: detail of the Acheulian level with handaxes and cleavers in square J-14.

The site has not been dated with any precision. It clearly fits into the Melka Kunture stratigraphic sequence. However, the best chronological guidelines for the site derive from the typological study of the finds (handaxes, cleavers and bolas) which provide us with information that can be related to other East African sites. A hypothetical date for the site lies between 0.60 and 0.40 Ma.

Fauna

The bones and teeth found on the Melka Kunture sites tend to be well preserved. Garba I on the other hand is the exception that breaks the rule in that the bones are very fragmentary. This could be due to various reasons, some of which may be natural. The frequent temporary submersion beneath the flowing waters of the tributary (the site lies on the bed of an intermittent river course) could explain the movement of the faunal remains. Other causes could be due to the interference of humans. The procedure of systematically shattering animal bone was more developed towards the end of the Acheulian than during the Oldowan or Early Acheulian.

Whichever of the two, a few whole faunal remains were found, though their state of preservation was only very mediocre. There is an abundance of very small fragments of animal bone.

There is still a higher proportion of *Hippopotamus amphibius*, but Suids have come to light as well as other examples of animals typical of a dry savannah, such as antelope (*Damaliscus* sp.) and some Bovids (including *Connochaetes taurinus*). Examples of Equids are somewhat rare. A few crocodile teeth were recovered.

As for the microfauna J.-J. Jaeger has identified, apart from hare, mostly several types of small rodent.

Flora

The environmental conditions on the Garba I site at the time the Acheulian deposit was created would have been comparable to a dry savannah, decidedly more so than is to be found in the area today. In fact, it would have been more similar to the barren acacia savannahs of the Ethiopian Rift Valley in the Oromo country. The environmental samples were taken from the heart of the Acheulian deposit. R. Bonnefille's research (Bonnefille 1976) into the pollen of the micro-flora from the Garba I sites shows a clear predominance in the number of grass types, with an overwhelming amount of *Graminaceae*.

The pollen analysis of the samples taken from the Upper Acheulian layer of Garba I clearly illustrates the depletion in the number of hilly woodland species in this period. *Podocarpus* is the only species present, no longer accompanied by *Olea*, *Juniperus* or *Hagenia*. A few shrubs such as *Shrebera* and *Brucea* are to be found on the lower slopes of the mountain below the forest belt. The abundance

Trees, shrubs and liana			
<i>Podocarpus</i> cf. <i>P. gracilior</i>	Podocarpaceae		29
Cf. <i>Sherbera</i>	Oleaceae		1
<i>Brucea antidysenterica</i>	Simarubaceae		2
<i>Dodonaea viscosa</i>	Sapindaceae		17
<i>Combretum</i> cf. <i>C. microlepidotrum</i>	Combretaceae		1
<i>Celtis</i> cf. <i>C. kraussiana</i>	Ulmaceae		5
<i>Acacia</i> sp. type <i>A. mellifera</i>	Mimosaceae		10
<i>Hymenocardia acida</i>	Euphorbiaceae		2
Total			67
Grass types			
<i>Gramineae</i>	Gramineae		555
<i>Chenopodiaceae</i>	Chenopodiaceae		5
<i>Plantaginaceae</i>	Plantaginaceae		5
<i>Compositae liguliflorae</i>	Compositae		6
<i>Compositae tubuliflorae</i>	Compositae		8
Cf. <i>Artemisia</i>	Compositae		1
<i>Rumex</i> cf. <i>R. abyssinicus</i>	Polygonaceae		4
<i>Barleria</i> sp.	Acanthaceae		1
<i>Cyperaceae</i>	Cyperaceae		10
Total			595
Pteridophyte spores			6
Unidentified			3
Overall total			671
Trees pollen / overall total			9.98%
<i>Graminaceae</i> / overall total			82.70%

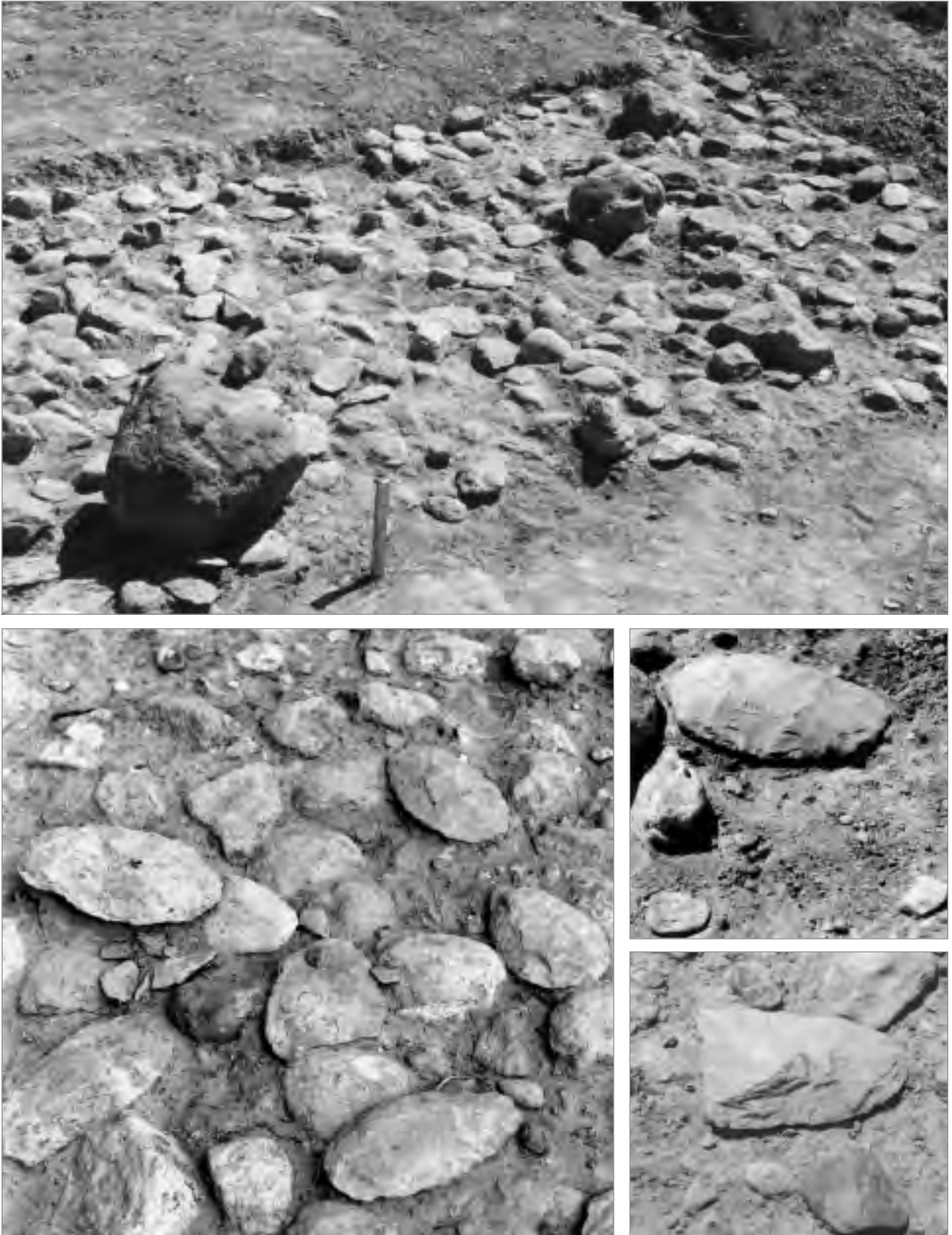


Fig. 23. Garba I. Upper Acheulian level. *Top*: Southern sector during excavation in 1965. *Bottom to the left*: detail of the excavation showing handaxes, cleavers and flakes. *Bottom to the right*: obsidian handaxe and trachyte cleaver.

J. Chavaillon, A. Berthelet

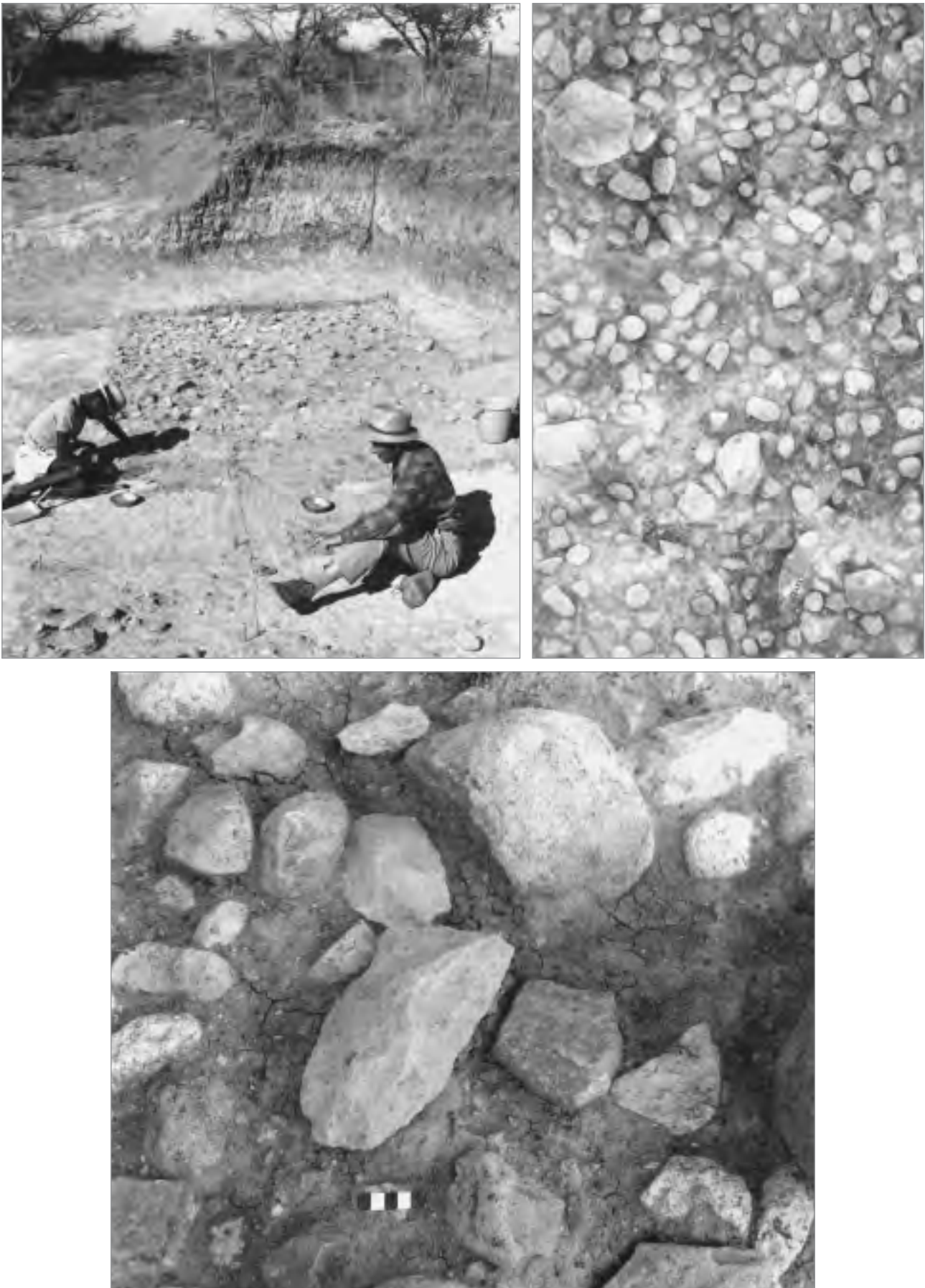


Fig. 24. Garba I. Upper Acheulian Level B. *Top to the left*: excavation of the Acheulian level. *Top to the right*: view of 4 to 5 square metres of the Acheulian level (excavations 1965-1967) with several handaxes and cleavers. *Bottom*: detail of the Acheulian level with a large basalt cleaver and an obsidian handaxe.

of *Acacia* similar to the *mellifera* type, and the existence of *Hymenocardia* and *Combretum* (no longer present in today's environment) imply that the vegetation on the site was decidedly drier than that of the Oldowan Gombore IB site. This adds to the evidence for an increase in the number of *Chenopodiaceae*.

Lithic assemblages

The Garba I site is a typical example of an Upper Acheulian archaeological deposit on the High Plains of East Africa and the Rift Valley. The presence of numerous handaxes and cleavers is typical (Figs. 25, 26), and although technically evolved these tend to be morphologically monotonous. Other characteristics include the presence of tools on pebble and more or less spherical bolas.

Percussion material

There is an abundance of percussion material, as is the case of other Oldowan or Acheulian sites of Melka Kunture, though less than at Gombore I. This material is more specialised. The tools on pebble with signs of percussion include both manual (active) and fixed (passive) tools. Though there are fewer broken pebbles than on earlier sites, in some cases it has still been possible to fit them together again. The evidence suggests that the Acheulians tended to use choppers of a more or less standard size and weight.

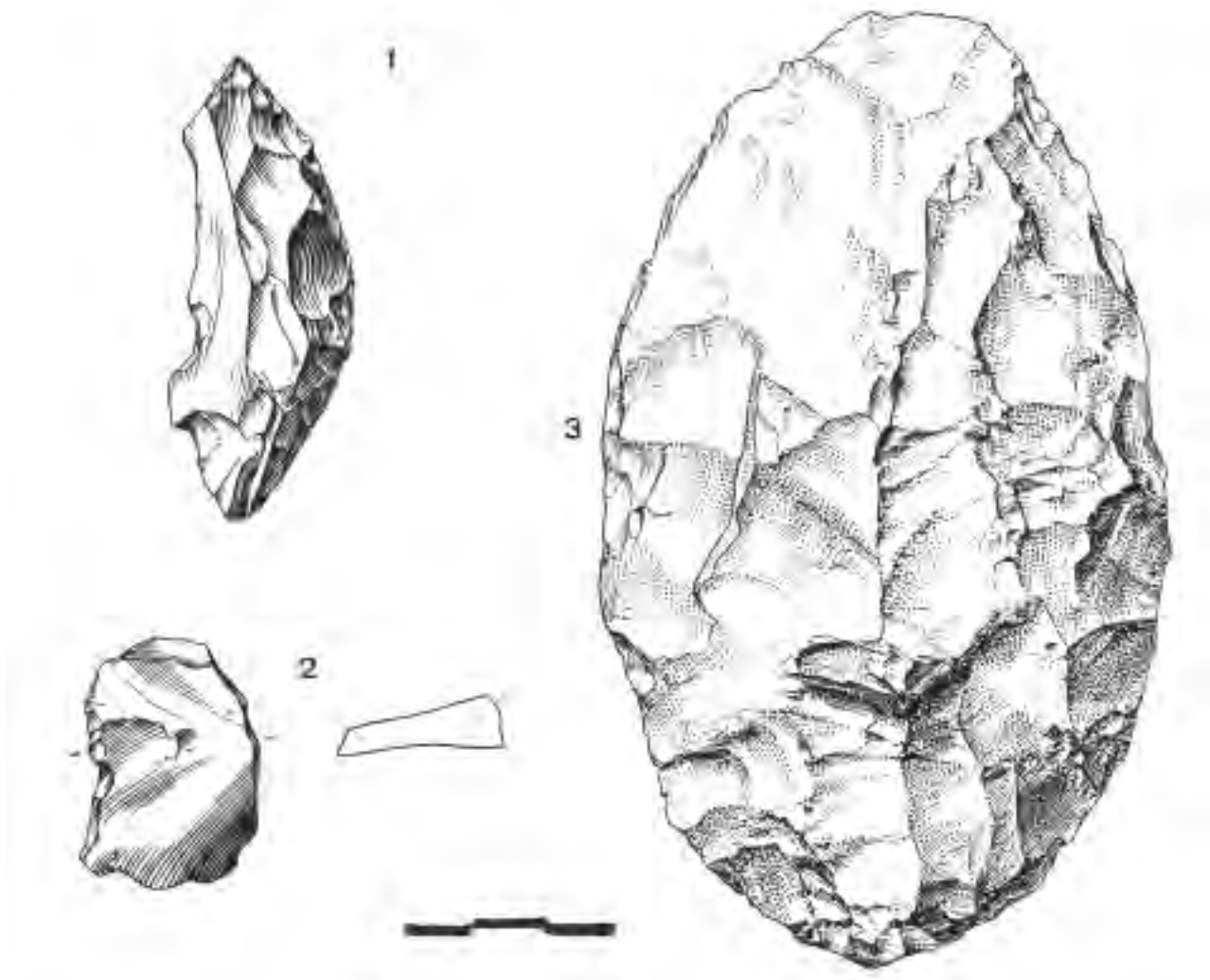


Fig. 25. Garba I. Lithic industry from Level B, Upper Acheulian. 1: convex side-scraper; 2: flake with inverse retouch; 3: oval handaxe. 1, 2: obsidian; 3: trachyte. Drawings by C. Chavaillon

Tools on pebble

The pebbles knapped and worked into different types of tool, such as mono and bilateral choppers, heavy end-scrapers and grinders, were gathered from a nearby beach or on the bed of the tributary. The procedure used to shape choppers and polyhedrons is technically mediocre.

The choppers are generally small. Bifacial choppers represent 70% of the total choppers. Lateral and distal choppers reach 50% and choppers with peripheral cutting edge reach 16% (only 4.85% at Gombore I). Eight to ten removals are frequently necessary to obtain an acute working edge (50° to 80°) which is not different from the edge of the handaxes: at Garba I, perhaps the technology was similar for handaxes and choppers.

Polyhedrons are fairly frequent, especially spherical polyhedrons, sometimes tending towards completely spherical bolas. There are so many bolas on the site that there would almost appear to be a standardisation in their production: they are about 80-90 mm wide and weigh about 900 g. These same characteristics are found on two Acheulian sites in Kenya, Olorgesailie and Isenya. However, their significance is yet to be defined. They may well have been used as missiles during hunting. Apart from this, they may have been

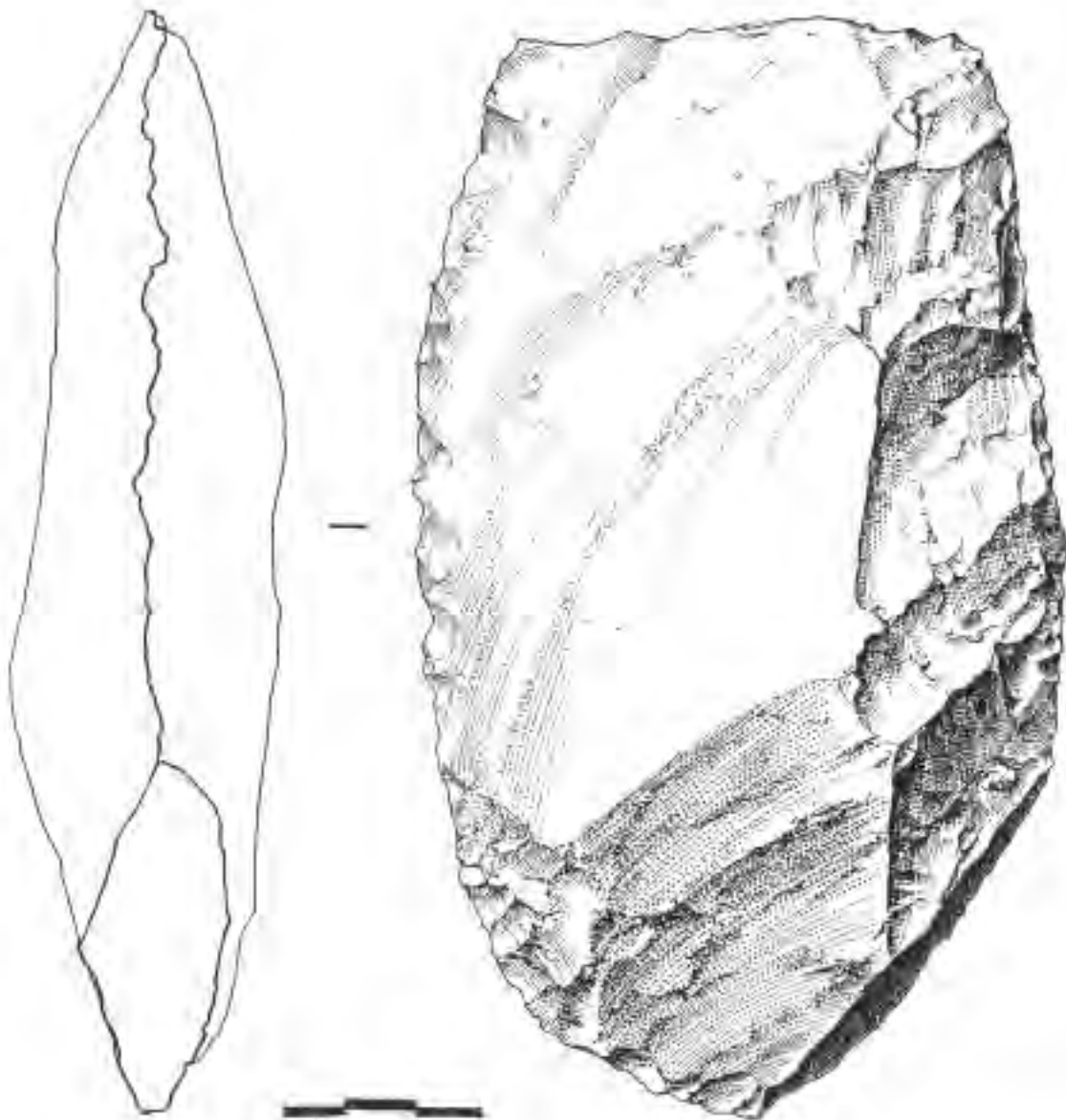


Fig. 26. Garba I. Lithic industry from Level B, Upper Acheulian. Cleaver with convergent and retouched edges.

Trachyte. Drawing by C. Chavaillon

harnessed within a net made of animal skins or tree bark and, once mounted on a handle, used to shatter large faunal remains or to grind plants, bark and tough seed pods or nuts.

The group of heavy end-scrapers is worthy of attention. Thick scrapers with a steep working end are frequent. However, there is a substantial number of steep nosed rabots. Not only have these tools been carefully worked or retouched, but often the same tool has two or even three edges that show signs of usage. The Acheulians used or reused the negative scars and the striking platform of the original rabot as a point of departure for a further process to obtain another working edge. These double or triple rabots are particularly frequent at Garba I and are a characteristic of this site.

Handaxes and cleavers

Handaxes and cleavers are considered by us to be the most characteristic artefacts of Garba I. They tend to be cut from basalt or trachyte, occasionally from volcanic tuff or obsidian. The latter is prized given its rarity in the area of Garba. The handaxes show signs of accurate secondary working, often over and over again, which goes to explain why the elements that have been found have often been discarded after being utilized to the limit. Some handaxes, no longer usable as such given the wear on its cutting edge, were reworked into notched tools; some others lost their original function as handaxes, evolving into a large side-scraper.

The handaxes tend to be oval. They are either flat or very flat. Sometimes they form an elongated ellipse: these are similar to the "*limande*" handaxes from Charente and Picardy. Others are cordiform or even rounded (discoïd handaxes). They are usually about ten to twenty centimetres long. The secondary working is often consistent around the entire edge, apart from the proximal part. However, one of the two faces tends to be preferred.

The handaxes may be numerous and of a standardised shape and type, while some tools have a distal pointed or cutting edge. They can have a sharpened point (and only the point) or the whole length of the tool can be worked to create an uniform pointed instrument. These pointed tools can be divided into two classes of artefact in which the process used for their manufacture is very similar but the end purpose of the tool is very different. One type consists of handaxes with a sharpened point, made from a block or flake. The cutting edge is worked in the same manner as an handaxe. The secondary working may be applied to the whole of just one side, or to both faces.

The other class is made up of cleavers, which tend to be completely unworked flakes with a functional cutting edge. These are fragile objects. The cutting edge, once shattered, can no longer be reworked. This would explain the frequent evidence of secondary reworking on some tools. For example, a badly damaged cutting edge may be transformed into a notched tool. However, it is usual to find that one of the faces of a tool has been reworked into a large, slightly convex scraper with the aid of regular uninterrupted reworking of its blade edge. The cleavers tend to be U-shaped; even more frequently the length of the cutting edge is usually less than the maximum width of the tool.

Débitage

The débitage is significant. The cores are usually small and are frequently worked from small obsidian pebbles picked up on the beach. There is an abundance of whole or broken flakes which tend to be very small, sometimes showing slight signs of utilization.

Tools on flake are either on obsidian or on other volcanic rocks. A characteristic of this archaic period is the frequency of notched tools and denticulates. Numerous small side and end-scrapers have been found, together with some awls. The technical preparation of the latter is evolved for the period and anticipates the small tools in the lithic assemblages of the end of the Acheulian and of the Middle Stone Age. In spite of

the rough technique used in their production, some miniature handaxes and small bifacial tools (4-6 cm) fit into the lithic assemblages typical of the beginning of the Middle Stone Age.

Thus the dominant and overriding characteristic of the site is the presence of numerous handaxes and cleavers. Though the lingering presence of tools on pebble casts its archaic shadow over the site, some of the tools on flake and very small handaxes may be considered forerunners of the Middle Stone Age.

Lithic workshops

The raw materials used for tools were collected from various sources. The broken pebbles, hammerstones and choppers are worked from pebbles gathered close to the base camp, as well as the obsidian cores and the small tools. Most of the handaxes, cleavers, some of the polyhedrons, the bolas and the heavy end-scrapers were worked from the lava flows (basalt, trachyte and rhyolite). The large obsidian handaxes were worked from lumps of obsidian brought to the base camp having already been roughly prepared at source. This source could well have been several kilometres from the Garba site, perhaps at Balchit or Simbiro.

When the Awash Valley was inhabited by the Acheulians, the pebbles gathered on its beaches were worked into chopping tools, but the rocky outcrops were also recognised as another source of raw materials. The bulky and cumbersome tools such as handaxes and cleavers must have been roughly shaped at source. What we call workshops could have been on the base camp, close to it, or at the root source of the raw material some kilometres away.

Spatial organization of the site

The Acheulian groups that settled at Garba I on the sandy bed of a minor tributary of the Awash River, which may have been close by or further afield, may have occupied the area more than once. The abundance of tools found onsite supports this thesis. The small channel would have been about ten metres wide with high banks.

A wide polygon of large stones came to light on the occupational surface. Some of these weighed more than ten kilos. Could these be the remains of a structure, or, put simply, were these stones placed here intentionally?

There is some, rare, evidence of daily life on the site, such as the evidence of burning and the use of a domestic fire. One such piece of evidence is a burnt pebble. The analysis carried out by L. Casta (Laboratoire de Géologie du Quaternaire, CNRS) suggests the presence of a minor hearth where a temperature of about 400° had been reached. Further evidence came to light in the form of a broad stain of red ochre spread over some two to three square metres, with further small sausage shaped or rounded lumps of red ochre scattered over its surface. Some of the latter had merged with the underlying sand and gravels. The relative abundance of red ochre seems to imply that the population intentionally wished to obtain this product. The accumulated ochre, still yellow in its raw state, would have been placed on a hearth and scorched to make it red. What they used it for has yet to be discovered.

The 10000 finds from the Garba I site places it as one of the most important Upper Acheulian deposits in Eastern Africa. As such it compares to the Kenyan sites of Isenya (Roche *et al.* 1988) and Layer 7 of Ologesailie (Isaac 1977). There are, however, other more or less contemporaneous sites that are worthy of note: Gadeb 8, on the Upper Webi Shebele Basin in Ethiopia (Clark 1987; Clark and Kurashina 1979); Haroresa and Illala Dima to the northeast of Lake Langano (Chavaillon 1979a). Garba can be compared to the Douré Wadi (Berthelet 2002) and Saddai/Obock Wadi (Roubet 1982; Berthelet *et al.* 1992) in the Djibouti Republic, not to mention the deposits in Southern Africa, in Maghreb and the Sahara.

Garba III

The Garba III site first came to light in 1969. The same team that worked at Melka Kunture identified the site's fluvial deposits sealed in the midst of the Middle Pleistocene record. Mixed in with the predominantly obsidian gravels, various tools on flake came to light, technically similar to those of the Middle Stone Age.

In 1970 one of the team members, F. Hours, cut a small trial trench. The lithic assemblage recovered was similar to the Middle Stone Age (Layer A) in technique and typology. However, the tools recovered from the lower Layers B and C still presented Acheulian characteristics, in spite of being associated with a Middle Stone Age lithic assemblage. During the 1978 excavation a Middle Acheulian layer was identified amidst the lower sedimentary deposits. A major phase of colluvium separates these two archaeological sequences. The excavation of the occupation level of Layer B revealed three fragments of the skull of a hominid in 1978.

The excavation extends over some fifty square metres, though the upper layers occupy a little less than this. The lithic assemblages were studied by F. Hours (1976, 1979, 1982).

Excavation and stratigraphy

Garba III lies at about 2027 metres above sea level, some four or five metres below the Upper Acheulian site of Garba I and six metres below Garba VIII, which is also Upper Acheulian. The Garba III site lies 120 metres to the northwest of the entrance to the archaeological camp site.

The archaeological importance of the site lies in the fact that it fits into the final phase of the Acheulian and the transitional period from this into the Middle Paleolithic or Middle Stone Age.

The excavated stratigraphic sequence is described below with the thickness of the various layers in centimetres. The total deposit is some five metres deep. Occupational Layers A, B (Fig. 27) and C are immersed within the fluvial sedimentary deposits of a water course that cut through the sedimentary and volcanic deposits of the Middle Pleistocene.

Beginning of the sequence: present day erosion.

10-15 cm - Black Cotton Soil: gravels and sand.

60-70 cm - *Layer A*: Sandy with obsidian lumps. A very ferruginous layer. Numerous mussels (*Unio* sp.). Overlapping laminated gravels and sand. Layer A is made up of four archaeological layers datable to the beginning of the Middle Stone Age. There is an abundance of obsidian tools on flake.

10 cm - *Layer B*: Sandy ferruginous layer. Occupation layer *in situ*. Late Acheulian with small obsidian tools on flake and handaxes. Remains of archaic *Homo sapiens*.

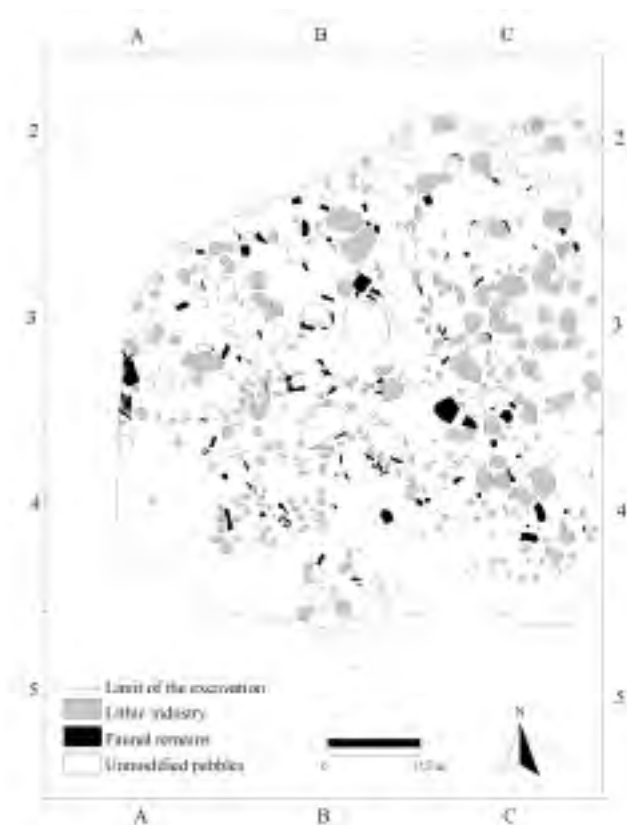


Fig. 27. Plan of the excavation of the Late Acheulian site of Garba III-B.

(Original plan by F. Hours, digital map by R. Gallotti)

30-40 cm - Compact grey clay without inclusions.

10-15 cm - Successive gravel and sand beds. At the top *Layer C*, a bed of coarse sand. Late Acheulian occupation layer (Figs. 28, 29 top).

Major colluvium: natural erosion of a deep water channel.

50 cm - *Layer D*. Layers of sandy clay. Several bone finds were recovered from the upper level (Level D). They were large (over 20 cm) and scattered randomly. This is not an occupational level.

40 cm - *Layer E*. Sand and gravels. One of the layers has Acheulian artefacts. Some of these show superficial wear on the edges. Various animal vertebrae were associated with the tools. Human occupation of the layer was short and the lithic assemblage is not very characteristic.

Colluvium: 40 cm - Tufaceous sediments. These could make up a part of Tuff D.

Colluvium: 220 cm - Clay.

Layer E could be dated to the Upper/Middle Acheulian. This is the end of the second sedimentary cycle of the fourth phase (see below). It could be a former bank of the Awash River. The river sedimentation (clay, sand and gravels) has created an alternating sequence of river deposits some seven or eight metres deep. This can be pinned down to the Late Acheulian phase present on Gombore III, Gombore VI and especially Garba I and Garba VIII. Contemporary with the original settlement on Garba III, a major phase of colluvium washed away the Middle Pleistocene levels, cutting a water channel through the deposit to the depth of Level D, if not lower. Subsequent ground wash deposited the sand and gravel fill of the water channel. This phenomenon had already been noticed, though on a greater scale on the sites of Garba XII and Garba I. This situation fits into J. Chavaillon's fifth geological phase, the beginning of M. Taieb's (1974) "Tabellian" period, otherwise signalled as the end of the Middle Pleistocene.

Chronology

There are no absolute dates to enable us to chronologically collate some of the levels of Garba III. At least three periods have been identified: the first, and earliest, dates to the Upper/Middle Acheulian. This includes Layers E and D which run fairly parallel to *locality 2* of Gombore II and Gombore VI, dating to some 0.70 Ma. A significant time span separates the latter phase from occupational Levels C and B, situated within the water course. These are datable to the Late Acheulian, some 0.30 to 0.20 Ma. The four levels that make up Layer A would appear to be Middle Stone Age, with lithic assemblages that date to some 0.15 Ma.

Fauna

The Garba III faunal remains vary from one phase to the next. The Late Acheulian levels

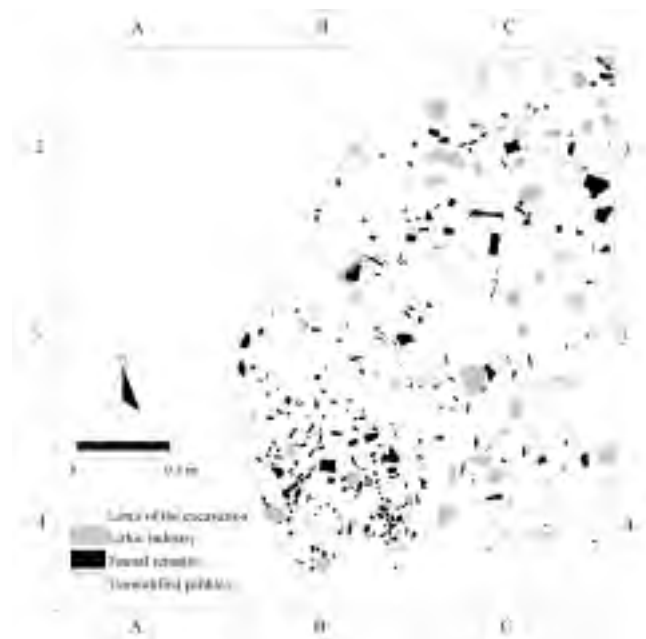


Fig. 28. Plan of the excavation of the Late Acheulian site of Garba III - C.

(Original plan by F. Hours, digital map by R. Gallotti)



Fig. 29. Sites of Melka Kunture. *Top*: the Late Acheulian site of Garba III with remains of archaic *Homo sapiens* skull.
Bottom: general view of the site of Kella.

include *Hippopotamus amphibius* and *Giraffa* sp., as well as *Kobus* sp., *Connochaetes* (gnu) and a few bones of Equid and elephant.

The highest number of rodent species were recovered from Layer E, the Upper/Middle Acheulian level of Garba III. Two families are represented in the microfauna. Large molars of *Muridae* have been identified as those of *Oenomys kulturensis* nov. sp. They have a vaguely triangular ridge and are the same as those of *O. olduvaiensis*. The other species present is *Stenocephalemys* sp., a strain local to the Ethiopian High Plains. *Otomys* cf. *typus* has been identified in the Olduvai deposits from Bed I to Bed IV. *Rhizomidae* remains make up to 95% of the faunal record, clearly outweighing all other species on all of Melka Kunture's archaeological sites. These are represented by *Tachyorictes konjiti* nov. sp. The Layer E faunal remains appear to confirm that environmental conditions on the Garba III site during this phase of the Acheulian were of a clearly mountain biotype (the fauna would have been very similar to that found at present at around 3000 metres above sea level) with mountain steppe and highland evergreens. A dense woodland band along the banks of the Awash would have provided the necessary habitat for *Oenomys* (Sabatier 1979, 1980-1982).

In the sandy levels of Layer A *Unio* sp. mussel shells were retrieved.

The fauna of Garba III, as on most of the sites of Melka Kunture, suggests the existence of a biotype similar to that of Olduvai in Tanzania, a dry open savannah fauna close to a water course (Geraads 1980).

Hominids

Garba III is one of the four Stone Age sites where excavations have uncovered human remains. On this Late Acheulian site three fragments of human bone, lying close to one other, were discovered towards the base of occupation Layer B. They were surrounded by predominantly obsidian flakes and lithic tools. One is a fragment of parietal bone, on which a stretch of sagittal suture is clearly visible (Chavaillon *et al.* 1987).

This is the earlier of the two Late Acheulian levels. The individual is of the genus *Homo*, and can be placed in the species *sapiens*. This individual made the last handaxes, as well as the tools on flake that were to become frequent in the subsequent Middle Stone Age levels. As a result the last of the Acheulians, yet to develop the flake tool technique typical of the Middle Stone Age, can be identified as *Homo sapiens*. This is a similar situation to the transition period between Oldowan and Acheulian at the hands of *Homo erectus* when the evolution of human technology in the production of lithic tools had to catch up with anatomy and biology (Chavaillon *et al.* 1978, 1979). Human biology was ahead of technological ability, just as the latter anticipates behaviour. In other words all evolves not synchronically, but apparently hierarchically: first physical and cerebral evolution, followed by technological innovations and finally, and this one takes time, a change in behaviour and traditional way of living.

Lithic assemblages

The lithic assemblages from Layers C and B (which are relatively close together in time) are diverse. There are tools typical of the Acheulian mixed in with small tools characteristic of the Middle Stone Age. This is a transitional stage between two Paleolithic techno-complexes.

Layer C

The Acheulian lithic assemblage is made up of large handaxes and cleavers similar to those of the Upper Acheulian Garba I site. These tools, though not frequent, are well worked with precise secondary retouch. The tools typical of the Middle Stone Age are worked from primary flakes, which are frequently

obsidian, into side-scrapers, awls and denticulates. There are many small handaxes and some small tools with secondary bifacial retouch.

Layer B

This layer is datable to the Late Acheulian, with handaxes and cleavers amongst the lithic assemblage. However these tools are less frequent, and of smaller dimensions. The production of the lithic assemblage is slightly more evolved than that of the underlying Layer C. There is an abundance of tools on flake, of which a few burins are worth noting. The small tools with secondary retouch on both faces tend to be made from obsidian. The secondary scaled retouch of the whole tool is a characteristic that is no longer unusual but tends to become the norm. The secondary retouch on these small tools that have been worked on both faces is similar to that on a few large Middle Acheulian obsidian handaxes from Gombore II.

The first traces of Levallois débitage came to light in this layer, but become far more frequent in Layer A. Though Acheulians had grasped this new technique it was still little used.

Layer A

In the gravel and sand Layer A there are no handaxes in the lithic assemblages, apart from a few small tools with secondary retouch on both faces. There is an absence of large handaxes and cleavers. There are obsidian primary flakes and tools on flake. These include side-scrapers, frequent end-scrapers as well as points with secondary retouch on both faces. Technically, these tools are characteristic of the Middle Stone Age. Layer A can thus be clearly dated to the Middle Stone Age. It should be borne in mind that on the sites south of Melka Kunture, close to Lake Ziway, the first signs of the Middle Stone Age date to approximately 0.20 Ma (Wendorf and Schild 1974; Wendorf *et al.* 1975).

Spatial organisation on the site

The Upper/Middle Acheulian finds from Layer E do not provide us with any more information than we already have in regard to this period. It should be borne in mind that the area excavated is somewhat limited. Layer D provided us with only fossil remains.

E. Hours' analysis of the Late Acheulian occupational Levels C and B indicates that the abundance of side-scrapers and tools on flake with signs of secondary retouch in Layer C is tied to activity pertinent to a butchery site, whereas the signs of crushing and grinding on the frequent bone finds in Layer B would account for the very high number of stone chips in this layer compared to those from the other sites of Melka Kunture.

On the Upper Acheulian site of Garba I a small hearth was documented as well an indication of the domestication of fire. On the Garba III site, on the other hand, there is no such evidence. However, the surface of Layer B has been cut by various small basins. These cut down through the clay subsoil that seals the underlying Layer C and have vertical sides and a virtually flat bottom.

Conclusions

The geology of the site is not the only interesting aspect of Garba III. Three archaeological periods have been identified, separated one from the other, at least in one case, by a major phase of colluvium. The Late Acheulian lithic assemblages include a selection of earlier tools mixed with others that are decidedly modern. There is evident miniaturisation of the tools and a standardisation in the use of primary flakes. Obsidian has tended to become the predominant raw material for tool production (Chavaillon *et al.* 1978, 1979). This

technical evolution, due to a combination of different traditions, entails changes in the group's hunting economics and organisational behaviour. Though the lithic assemblage on Garba III is still Acheulian, the array of tools shows clear signs of evolution and humans had developed into a new species: *Homo sapiens*.

Kella I

The site of Kella I (Late Stone Age) was prospected and excavated on 1965 by J. Chavaillon. A second excavation at the same site was carried out on 1970 by F. Hivernel. Kella is also the first site discovered by G. Dekker on 1963 and initially prospected by G. Bailloud. A high number of handaxes, cleavers and other acheulian pebble and flake tools were scattered at the surface in this area.

Kella I is located on the right bank of a tributary of the Awash whose seasonal waters join the Awash at the ford of Melka Kunture.

The same tributary eroded ancient and recent alluvial sediments as is the case at the Late Stone Age site of Wofi, located three km north of Kella, which is however the most ancient Late Stone Age locality until now known at Melka Kunture.

Stratigraphy

The volcano-sedimentaries formations of this area were studied by M. Taieb (1974) who attributed them to the four main Quaternary epochs:

The basal level (Lower Pleistocene) is represented by sandy diatomitic clay. From the top to the bottom Middle Pleistocene is constituted by: 1 - sandy clay; 2 - an obsidian and basalt gravel stratified with a compact clay level, where some tools on pebble have been found; 3 - sands with small obsidian gravel.

The last unit of the Middle Pleistocene deposits is a level of thin ferruginous gravel covered by sands and gravels containing some Acheulian tools and faunal remains. This is the site where both G. Dekker and G. Bailloud collected several stone tools.

The entire sequence has been largely destroyed by the formation of an ancient fluvial terrace. Some more recent Upper Pleistocene alluvial deposits, as for example the small Kella hill, were set down. These sandy and clay sediments contain some volcanic elements; lithic tools related to Middle Stone Age have also been found *in situ*.

At the top of these formations, two brown clay levels with montmorillonite represent a brown Black Cotton Soil where an obsidian epipaleolithic industry was present.

The entire sequence was covered by a Black Cotton Soil reaching a thickness of some metres.

The lithic industry

Three archaeological levels have been observed. The most recent one was also the richest one. Obsidian tools present sometimes a double patina.

In the upper level several obsidian cores, flakes, blades and bladelets have been found. Débitage is of an Upper Paleolithic type, with prismatic cores sometimes presenting crossed striking platforms.

Tools are represented by obsidian side-scrapers, end-scrapers, borers, denticulates, notched pieces and backed knives.

Burins are frequent and they recall the same types of certain Kenyan sites: there are some plan and on angle burins and some burins on truncation, sometimes double or even multiple.

Notched pieces are frequent, both on flakes and blades. Denticulates are especially on blades and they often present an inverse retouch.

End-scrapers are also frequent: they are sometimes circular end-scrapers on the extremity of a blade or a flake or core-like end-scrapers.

The abrupt retouches of backed blades from Kella recall Chatelperron points but also some Capsian retouched blades from the Northern African Capsian (Chavaillon 1968). We can also note the presence of some borers on flakes, of simple side-scrapers and of inverse retouched blades.

Finally, we must remember the presence of some tools similar to the lithic artefacts found at Gamble's Cave in Kenya by L.S.B Leakey, called "scaled blades" or "sinew-frayers" and consisting on broken blades with an inversally retouched truncation.

Some small obsidian choppers have also been found. Débitage is frequent and is represented by flakes and especially by blades and bladelets. No geometric microlithic tools have been collected at Kella while one of them was found at Wofi and they are frequent at the Late Stone Age site of Mojo.

Assemblages from Kella, Wofi III and Wofi IV show similar features and tools from Kella could be the most ancient ones.

Wofi

This Melka Kunture deposit lies some three kilometres upslope from the Gombore and Garba sites. It is located at the mouth of a small tributary that runs into the left bank of the Awash River. As has been previously documented on the Kella site (Fig. 29 bottom), the tributary helps to drain off the south-flowing flood waters both past and present with their subsequent fluvial deposits, carving through sites such as Balchit and its environs with large lumps of obsidian.

General situation and geology

The geological substrata are made up by brownish black clayey sediments, "Black Cotton Soil", which seal both the Awash flood deposits (Wofi I) and the ignimbrite terrain. Three sites have been identified:

- Wofi I: Stone Age site with some earlier levels.
- Wofi II: surface concentration of finds, including a majority of unpatinated tools, and a small selection of 27 patinated tools.
- Wofi III: surface concentration of finds. The archaeological deposit lies *in situ* sealed within a brownish black clayey layer dating to the Holocene. The finds were recovered from these sedimentary deposits.
- Wofi IV: surface concentration of finds with few tools. However F. Hivernel found a geometric microlithic tool, the only example of a trapezoidal tool found thus far at Melka Kunture (Chavaillon 1978).

The Wofi sites were discovered during a survey supervised by J. Chavaillon. Research into the Wofi III site was put into the hands of F. Hivernel (Hivernel 1971, 1977; Newcomer and Hivernel 1974). Wofi II was studied by M. Abye (1983-1984).

Wofi II and III are both geologically and typologically very similar. Archaeologically, they can be dated to the Late Stone Age and fit into the Melka Kunture chronology sandwiched between Kella and Balchit.

The predominant type of raw material found on site is an alkaline obsidian which fits into group 1 (Cann and Renfrew 1964; Renfrew *et al.* 1966). This obsidian is rich in barium, but has a poor zirconium

count. From these analyses the Wofi obsidian is similar to that of Balchit, and may well be the same as that from Kella and Gombore IA. This could be explained either as the result of erosion action of the tributary, or the intervention of people. So the twentieth century tanners that make their way to Balchit in the search of this raw material, walk in the footsteps of prehistoric man.

Lithic assemblages

Lithic finds and several potsherds have been recovered from both sites. The former tend to be in obsidian. There are no faunal remains for either site.

A simplified finds inventory follows:

Finds	Wofi II	Wofi III
Cores	29	37
Débitage	105	202
Tools	142	152
Total	276	391
Potsherds	57	32

Archaeological finds of Wofi II and III.

The débitage includes as well flakes and simple blades as retouched flakes and blades. The débitage of the Wofi II and Wofi III industrial assemblages includes three archaic characteristics:

- a high proportion of flakes compared to blades and bladelets, 61% at Wofi II and 56% at Wofi III. The rarity of bladelets is distinctive (0.4-1.4%).
- an abundance of flat striking platforms: nearly 75% of the total per site.
- the angles of the butt/ventral face are worth noting. Numerous examples exceed 90°, and at times reach as much as 120°; 70% at Wofi II and 88% at Wofi III.

However, there are differences between the two sites. The finds from Wofi II were recovered from the surface during the survey, and as a result 63% of the finds are damaged. On the other hand, the industrial assemblage from Wofi III was recently recovered *in situ* from its sedimentary context and only 36% of the finds are damaged.

The Wofi III industrial assemblage is more homogenous than that of Wofi II and, unlike the latter, includes long blades (12 cm) and large flakes (10 cm).

Cores

The typological analysis has identified few types, but it has highlighted a predominance of pyramidal cores. These make up over half the total number of cores. On the Wofi III site F. Hivernel has marked out eight cores for blades or flakes showing one or two truncations that subsequently served as a striking platform. The limited number of small blade finds (5) could be explained away by the fact that they may have disappeared down the cracks in the drying black cotton soil.

Tools

There are flakes and blades with signs of secondary retouch. The proportionate number of each type of tool is fairly homogenous from one site to the next.

A finds inventory follows:

Types	Wofi II	Wofi III
End-scrapers	27	13
Side-scrapers	27	15
Burins	15	6
Awls	7	3
Backed knives	7	
Truncated tools		10
Tools with minor retouch		7
Notches	40	54
Denticulates	20	15
Total	143	142

The lithic assemblage of Wofi II and III.

The notches and denticulates, though characteristically archaic, are the most abundant type of tool, 42% and 48% respectively.

There are various types of side-scrapers: simple, double, convergent or déjeté.

The end-scrapers are worked on either thick or thin flakes and they show a very poor technological skill. The presence of four thumbnail end-scrapers from Wofi II are worth noting, a characteristic that lingers on into the Late Stone Age.

There is a high number of plan or angle burins (10% and 4% respectively), though less abundant than on the Kella site. The awls from Wofi II show signs of better workmanship.

The backed knives on the Wofi II site tend to be atypical.

Patinated tools

On the Wofi II site the main group of tools is associated with veined and patinated obsidian. This small group totals 27 tools, and indicates a hypothetical interference of the site's surface, possibly due to colluvium or occasional surface streams. Various objects are worthy of note: the cores include a small blade prismatic core, a flake core and two globular cores, though there are no pyramidal cores; whereas among the tools there is one inverse side-scraper, one end-scraper trimmed from a thick flake and two awls.

Potsherds

The potsherds and grinding equipment on the Wofi III site, which include grindstones and pestles and mortar, are associated with the lithic assemblage. They are in a better state of preservation than on the Kella site. Among the potsherds on both Wofi II and Wofi III, parts of the neck of various pots have been identified, as have handles, and a few decorated fragments (one with comb decoration). The pottery selection from Wofi II is heterogeneous; it includes coarse-ware pottery, fine-ware and red slipware, coloured both inside and out.

Conclusions

How can we place Wofi II and Wofi III?

As a basic guideline, M. Abye has indicated the existence of three groups of artefacts. The earliest includes a few patinated tools and others. Subsequent analysis separated the non-patinated tools into two

groups. One includes such small tools as thumbnail end-scrapers, awls and a few denticulates. In spite of the lack of microliths on the two sites, Abye (1983-1984) suggests that they could be associated with the Eastern African Wilton. In the Western and Eastern Cape in South Africa, the Wilton industrial assemblages are dated to around 8000-4000 BP.

In the second group the tools worked from large flakes and larger blades are more recent and therefore chronologically closer to the finds from the Balchit site. Abye conjectures that these could be associated with the Elmenteiten of Eastern Africa (in Kenya from 3000 to 1300 BP).

Chronologically, the Kella lithic assemblage could be more ancient, prior to the "Wilton" group of Wofi II. The lithic assemblages from the later layers in the Wofi II sequence are fairly similar to those of Wofi III. The latter two show certain similarities to the industrial assemblage from Balchit (J. Soulier and Ph. Soulier excavation; 1976). On all three sites there are frequent conical cores. Balchit is hard to fix chronologically given that the area continued to be frequented until the present day thanks to the wealth of obsidian in the soil. In the previous century the site was exploited by local tanners for its obsidian deposits that they worked into blades. The debris left by twentieth century people is made up of flakes, blades and cores.

Balchit

The site known as Balchit lies some six kilometres north of Melka Kunture, having taken its name from a nearby village. The name "Balchit" is not accidental given that in the local language Oromo the word means obsidian. Large crushed lumps of obsidian, as well as shattered flakes and cores are visible scattered over several square kilometres. This obsidian was concentrated over a surface some seventy metres long to a depth of half a metre. In some points, about ten metres wide, the obsidian deposit reached a depth of over one metre. These concentrations were bordered by shallow pits where the ground scrub was thicker.

Stratigraphy and datation

The piles of obsidian are no more than the spoil heaps from abandoned obsidian quarries. The obsidian is sealed in nodules within the volcanic tuff. A pit was dug to extract the obsidian. Once this small-scale open quarry was exhausted a second quarry was opened, and the disused pit of the first was backfilled with the spoil from the next.

In the search for obsidian, people may have frequented Balchit since the Stone Age. It is not always necessary to dig down into the soil to strike an obsidian vein. At times, still to this day, the raw material can be brought to light in its primary state by erosion. In a somewhat marginal area of the site a short archaeological sequence was documented. At the base of one of the obsidian scatters various obsidian fragments with a fairly light patina were identified. This compares with the piles of obsidian on the surface, which are made up of fragments, flakes and cores without any patina.

It would be difficult to date these objects with any precision. Balchit must have already been known to people in the Late Acheulian and the Middle Stone Age, perhaps even earlier (see Poupeau *et al.* in this volume). On the other hand, we know that some of the artefacts found on the Late Stone Age sites of Melka Kunture have been worked from fragments of obsidian from Balchit. These may have been washed naturally down river by the waters of a tributary of the Awash, or carried home by Stone Age people while out to reconnoitre their environs. However, the overriding evidence that hits the eye at Balchit is what remains of a fairly recent industrial activity that has continued to the present day.

As part of the research underway into the archaeology of Melka Kunture, in 1973 Ph. Soulier, J. Soulier and B. Aubineau cut a first trial trench through one of the Balchit obsidian piles. The archaeologists immediately noted that there was far more natural debris than man made flakes and cores (Muir and Hivernel 1976; Soulier 1976).

The lithic assemblages

The lithic assemblages tend to be made up of large blades, often over 20 cm long. They often have a triangular shaped section. There are also large, broad flakes. There are also artefacts of smaller dimensions. Occasionally either the point or the end of the flakes and blades have snapped off. The striking platforms tend to be flat, but a few are punctiform. The striking angle tends to be between 110° and 130°. The frequent evidence of chipping on the edge has been caused by the artefacts being trampled underfoot and is not a sign of use-wear.

Close to these scatters of obsidian flakes, there are natural fragments as well as numerous cores. The latter are simple, and of a standardised shape. There is a predominance of pyramidal cores, with a series of peripheral and blade flaking. In the preparation of the base of the core, this has either been truncated with a single clean flake, or carefully trimmed down into the required shape. Other cores, though very similar, are not pyramidal but prismatic. The flakes have been trimmed off at right angles to the base. Some of the signs of trimming on the core appear to be accidental; these are polyhedral cores.

The trial trench cut by Ph. Soulier through one of the obsidian piles next to a pit provided clear evidence that most of the obsidian finds had been fractured naturally. This had occurred following rapid cooling of the lava in which they were sealed, and not due to any intentional working of the rock. The obsidian nodules that had not been extracted from their bed of volcanic tuff showed signs of natural fracturing similar to those already noticed on fragments from the small trial trench and the obsidian pile.

The piles of obsidian and the morphology of the site are due to quarrying activity for the veins of this glassy rock:

1. The far-reaching expanses of obsidian are spectacular. Numerous cores, large flakes and blades, as well as an abundance of debris can be seen: this is evidence of workshops.
2. The humps or piles, of limited proportions (a few metres wide), often grouped together, are made up of volcanic sediments, fragments of naturally fractured obsidian, as well as a few rare flakes extracted from the quarries.
3. A few shallow pits can be seen next to the spoil heaps. These were dug in the search for the obsidian veins. Though a few have been partially backfilled, most were still free of rock fragments or lumps of stone.