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Marcello Piperno

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The prehistory of Melka Kunture (Ethiopia)*

1. A brief history of discoveries and researches

The site of Melka Kunture was discovered and proposed to the attention of the Ethiopian Archaeological Service for the first time in 1963 by G. Dekker. The same year a French prehistorian archaeologist, G. Bailloud, carried out the first surface surveys and collected important lithic materials and faunal remains.

Since 1965, a French-Ethiopian mission directed by Jean Chavaillon faced to the systematic investigation of the Paleolithic site through intensive excavations in some of the archaeological levels, together with the surveys of the large area occupied by prehistoric finds, the definition of the chronostratigraphy of Lower and Middle Pleistocene sediments and the study of the Uthical and faunal occurrences insofar put to light. An interruption of field activities took place after the 1982 excavation campaign; in the following years, the study of a great part of archaeological materials discovered during extensive excavations and stored in the Melka Kunture Laboratory in Addis Abeba was nearly accomplished. Excavations in some Middle Pleistocene Acheulean sites of Melka Kunture started again in May 1993 since 1995, under the direction of Jean Chavaillon.

2. Geological background, chronology and main cultural subdivisions

Melka Kunture is a valley site, which extends for almost 6 km in both Awash River banks, with superimposed terraces whose remains are preserved to a maximum of 100 m of sediments. The site is located 50 km south of Addis Abeba in a lateral branch of the Rift Valley.

The fluviatile sedimentation (pebbles, gravels, sand and clay) has been frequently interrupted by the volcanic activity whose products (tuffs and lava) represent crucial markers for the stratigraphical correlations between different archaeological outcrops in several areas of the site.

Amongst more than 70 archaeological levels in so far discovered, about 30 have been more or less extensively excavated. The beginning of the sequence is denned by the Oldowan site of Karre, which can be correlated with the level B of Gombore I on the right side of the Awash, with a K/Ar age near to 1.6/1.7 m.y. Slightly after, the Developed Oldowan is represented by the sequence of the site of Garba IV, which will be later discussed in more details, with an absolute age comprised between 1-5 and 1.3 m.y. The Jaramillo magnetostratigraphic sequence is included between the Tuff A, which covers the Oldowan sites, and the Tuff B, dated from 1.07 and 0.84 m.y. Some important sites, such as Garba XII arid Simbiro III, wich can be related either to a Late Oldowan/Early Acheulean transitional phase (Garba XII) or to an archaic Acheulean (tine levels of Simbiro), are comprised in this chronological time span.

A following phase of the african Acheulean I is well represented in the stratigraphic sequence of Melka Kunture, by the site of Gombore II (Middle Acheulean) dated to 0.84 m.y.

The main studied site as far as the Upper Acheulean is concerned is the site of Garba I, with an absolute age comprise between 0.5 and 0.4 m.y., while the end of this long techno-complex is represented at Melka Kunture by the site of Garba III, approximatively dated at 0.2 m.y. The latest phases of the Eastern African Paleolithic, known as Middle and Late Stone Age (MSA e LSA), have been up to now studied in lesser details at Melka Kunture: a few levels with lithic industries related to the MSA are known through small tests, while the excavation of the site of Kella I gave the opportunity to found some LSA material.

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* Since the beginning of the Italian archeological Mission at Melka Kunture, there has been close collaboration with CRFJ researchers on the study and publication of paleo-anthropological material from Melka Kunture. During time spent at the invitation of the Center in November 1999, contacts were also made with the Hebrew University of Jerusalem.

3. The paleoenvironnxental reconstruction: paleontological and paleobotanical data

Systematic micropaleontological, paleontological and paleobotanical studies have been carried out on the long stratigraphical sequence of Melka Kunture.

They allow a rather satisfying reconstruction of the paleoenvironmental changes in this area of the ethiopian highlands during Early and Middle Pleistocene, that means in the chronological time span reflected by the archaeological evidence in the site. Environmental changes have been caused by fluctuations towards a more or less arid or humid climate that characterized the Pleistocene epoch in austral hemisphere.

Within a substantially unmodified savannah environment, such a fluctuations had, as a main consequence, a major or minor expansion of some arboreals species and as far as faunal aspects are concerned, a major frequentation of arid savannah by animals more adapted to dryer conditions (several species of Bovids, Equids. etc.) or, during most humid phases, a major expansion of different species *(Hippopotamus, Phacocerus,* Elephant, etc.) more adapted to a woodland savanna.

As elsewhere in Eastern Africa, however, the entity of the paleoclimatic changes suggested by the pollen analysis shows that they didn't reach an amplitude suitable to determine dramatic and substantial paleoenvironmental modifications.

The same situation is also indicated at Melka Kunture by the faunal associations found during extensive excavations in chronologically different sites, where the presence of mammals adapted to more or less humid or arid conditions is proposed in terms of statistical frequence of one or an other species rather than as an alternative frequentation of different mammals in the ethiopian Highlands.

In other words, the occupation levels corresponding to most humid climatic period will show, for example, more faunal remains referable to *Hippopotamus* and *Phacocerus* than to Equids or Bovids better adapted to open savannah.

4. The archaeological context and its interpretation

4.1. The Oldowan: Karre and Gombore I

The most ancient phases of the human presence at Melka Kunture have been widely studied through the extensive excavations of the site of Gombore I, on the right bank of the Awash river, and through some more limited excavations in the site of Karre, on the left river bank. Gombore I represents up to now the more extensive excavation carried out in Melka Kunture; its main paieosurface has been explored for about 250 square meters. It is an Oldowan site, characterized by a good concentration oflithic materials (12.000 artifacts have been found in the level B, dated at 1.7-1.6 m.y.) and of faunal remains. This site, located on a sandy and clayed beach, was buried by several meters thick clayey sediments. Lithic technology is characterized by a predominance of pebble tools, mainly side choppers; other types are also well represented, with the exception ofperipherical (discoidal) choppers. Polyhedrons are also frequent together with carinated end-scrapers, “rabots” and several other types, as notched tools, denticulated pieces and borers made almost on pebbles. Flakes are more rare and they show unfrequent modification by retouch. Basalt pebbles and blocs utilised as raw material for this tool kit were mainly found in the proximity of the site.

No peculiarly specialised activity areas have been found within the living floor, while a natural limit of the site has been localised by a progressive vanishing of tools and bones. In an other part of the living floor, an area without remains, which was surrounded by a huge accumulation of tools and bones, has been interpretated as a possible shelter. The paleontological study evidenciated the frequence of *Hippopotamus (Hippopotamus amphibius,* Equids *(Stilohipparion.*), Suids and Bovids *(Connochaetes, Damaliscus, Alcelaphini,* etc.). A humerus distal fragment, determined as belonging to *Homo* cf. *erectus,* was found in level B2. The association between *Homo erectus* and Oldowan is of great interest as far as the general question of the responsability of this technocomplex is concerned; its meaning and its possible interpretation will be discussed later.

4.2. The Developed Oldowan: Garba IV

The excavations at the site of Garba IV (1975-1982) allowed the exploration of the two upper levels C and p in an area of 100 square meters. The stratigraphic sequence below these two levels englobed in sandy sediments presents a superimposition' of three more levels (E, F, G)

comprised in a clayey matrix.

A small test-pit of four square meters was opened in 1982 until the level E, where it was possible to

found a fragment ol a child mandible interpreted as belonging to *Homo erectus*.

The systematic study of the lithic and fauna remains from the two upper levels C and D suggests that they could be assigned to the Developed Oldowan, with an approximative age of 1.5/1 4 m.y.

The frequentation of this site along the right bank of the Awash river took place during a slightly more arid period than the one observed during Oldowan times at Gombore I.

The greatest part offaunal remains belongs I to Hippopotamus amphibius, Suids, Equids and Bovids: *Metridiochoerus andrewsi, Phacochoerus modestuy, Kilpochoerus limnetes, Pelorovis oldowayensis, Connochaetes taurinus, Damaliscus, Gazella , Hipparion.*

As far as the archaeological aspects are concerned, level C reflects a short halt of a relatively small human group. Lithic and faunal remains are scattered in small quantities and they do not show any significant accumulation on the surface, possibly suggesting the presence of some activities areas. Altogether, 470 obsidian artifacts, 190 basalt pebble tools and flakes and 230 paleontological remains have been found. Level D represent on the contrary either a long-term living site or a place repeatedly visited by human groups who permanently (for some days, weeks or months) occupied it, organizing, in the same site, different kinds of common daily activities, such as stone tool making, butchering, food sharing, etc.

More than 3900 artifacts on obsidian, about 6000 tools and flakes on basalt and something less than 2700 faunal remains have been found during the excavations of part of the paleosurface extending about 100 square meters, with an overall amount of more than 12700 objects reaching in many square meters a very highly concentration.

Nevertheless the distribution of this material is not homogeneous on the paleosurface; two irregularly shaped areas, and an oval one, completely devoid of tools and bones are present in different parts of the *site.* In other areas, some large basalt blocs, weighing several dozens of kilograms, have been intentionally introduced in the site; the same blocs are usually surrounded by huge accumulations of large sized bone remains ribs, horns, fragment of pelvis of an Elephant, vertebras, teeth *of Hippopotamus,* etc.).

The functional meaning of these patterns of accumulations could be related to some kinds of activities dealing with meat sharing and consumption, but this hypothesis can only be inferred on the base of the recurrent association between heavy blocs and large faunal remains accumulations. It is also significant to note that an anomalous quantity of horns of antelope, for a total of 120 pieces, was scattered on the level D. One or possibly two areas within the living floor explored through the extensive excavations strongly suggest the existence of activities related to the process of manufacturing lithic tools from obsidian cores on pebbles and angular blocs. Detailed taphonomical studies of this areas have shown that the density of obsidian flakes, wastes and cores is highly greater than elsewhere in the level D; one of the two areas is located around one of the above mentioned large basalt blocs.

The general taphonomic study of the distribution of lithic and faunal remains doesn't show other equally significative areas as the ones already described. Nevertheless, in a large sector of the excavated area (about 50 square meters) on the left side of the erosion which cut in two parts the paleosurface, faunal remains and basalt tools seem to superimpose with a major density in a rather irregularly circular band which, in its turn, surronds some square meters with a minor density of tools and bones. Two text-pits opened at some distance (15 to 20 meters) from the main excavation, suggest that the up to now controlled extension of level D can be estimated at about a minimum of 700 square meters. Until now, none of the explored peripheral areas of the excavation coincides with an effective artificial limit of the paleosurface, whose original extension remains therefore unknown.

Main typological features of the Developed Oldowan at Garba IV

The most important differences of the lithic assemblage of the Developed Oldowan of Level D at Garba IV in comparison to the proceeding Oldowan complexes from Gombore 1 and Karre, have to be seen in the absolutely higher frequency of flakes and tools on flakes, in a better technological ability suggested by most of the pebble tools (choppers and polyhedrons), and in the presence of a very low number (four or five pieces in total) of handaxes together with two cleavers.

As far as the raw material is concerned, a sharp functional dicotomy must be underlined: the utilization of basalt is predominant for pebble tools, while obsidian is mostly choosed for tools on flakes.

In level C, the ratio obsidian/basalt shows a major frequency of the first one by respect to the latter; in level D the same ratio appears to be inverted: artifacts are more frequently cutted on basalt flakes and pebbles (either on other volcanic rocks with *the* exception of obsidian).

Considering this raw material distribution, it is possible to adfirm that the frequency offtakes at Garba IV is not entirely due to the manufacturing of pebble-tools, but reflects, on the contrary, a clear pattern of technological innovation. Obsidian pebbles and small blocks were used at an exaustive point: unutilised obsidian pebbles are in fact very rare in level D and obsidian cores are always intensively exploited, while several basalt cores often show only a moderate flaking.

The typological assemblage indicates that about 70 % of flakes has not been retouched, while the remaining 30 % has been either utilised or modified by retouch.

Tools made on pebbles and on flakes already show, in a general way, a rather good typological differentiation; several ikinds of medium to small-sized side scrapers are present, together with denticulated and notched pieces, and a few end scrapers, borers and buries. A few handaxes, on basalt and on obsidian, and two cleavers have been found in different areas of the main excavatior at Garba IV D; their very low frequency confirms their nature of "proto-types" within the Developed Oldowan techno-complexes.

4.3. The Acheulean: Simbiro III, Garba XI1J, Gombore H, Garba I, Garba III

The Early Acheulean

This long chrono-cultural phase is well represented at Melka Kunture in several sites, some of which has been excavated to a rather significative extension.

At the site of Garba XII, two meters of fluvio-lAcustrine sediments contain nine archaeological levels, four of which are living sites; the same sediments are comprised within two important Tuffs (Tuff A at the bottom and Tuff B at the top) respectively dated at 1.0 and 0.84 m.y.

The site of Simbiro, some 4 kms far, has a rather similar stratigraphical position and age. Both these sites represent up to now at Melka Kunture the most ancient living soils which can be attributed to the initial phases of the Acheulean.

Even if handaxes and cleavers, usually made on pebbles and therefore still provided by a considerable thickness, are represented in the different sites with an unequal frequency, nevertheless their presence is always statistically much higher than before.

A great part of the tool-kit is now obtained on, flakes, mostly on obsidian ones. Retouched tools are typologically well differentiated and show a good technological standardization, with more frequent and accurately retouched side scrapers; the step retouch in order to resharpening the edge of tools is now most widely adopted.

It must be observed that, especially in the basal level J at Garba XII, within this technological innovations, strong Oldowan features still mantain their importance; unifacial and bifacial choppers are still highly frequent, while discoidal ones can be interpreted as a transitional shape towards true handaxes; several large ovalar flakes, with a thriedrical section and an unifacial invadent retouch on the dorsal face, are frequent at Simbiro III.

Even the organization of the occupation floors shares some similarities with the Developed Oldowan sites, showing sometimes more frequent and more functionally clear areas for selected activities than before.

Large-sized Bovids, Antelops and *Hippopotamus* are the prevailing utilised animals at Garba XIIJ; a primate mandible of *Theropithecus (Simopithecus)* has been identified **in** the same living floor, while a skull of *Pelorouis oldowayensis* was found at Simbiro III.

The Middle Acheulean

This cultural period is especially represented at Melka Kunture by the site of Gombore II, a living floor located on a beach of pebbles and characterised by a large quantity of oval and cordifonn handaxes made on basalt and obsidian pebbles and flakes of various dimensions, with several pieces averaging in lenght from 5 to 8 cm.

A rather frequent feature in some obsidian handaxes is to present a lateral typically twisted edge. Other tools on pebbles are abundant in the same floor, while tools on flakes (side scrapers, denticulated and notched pieces and some end scrapers and borers) are present in a statistically important quantity.

A parietal and a frontal human bones belonging to the same individual, referred as a *Homo erectus*

have been found in this living floor.

To the same Acheulean phase can be attributed a very interesting site discovered in the proximity of Gombore II but some meters higher in the slope. The remains of two *Hippopotamus* are scattered on a surface explored to an extension of a few dozen of square meters; they are surronded by some tools, most probably used for their butchering: it is interesting to observe that no handaxes and cleavers have been found in this site and that the lithic assemblage suggest a rather opportunistic and "ad hoc" manufacturing, with few typologically well identifiable artifacts.

The Upper Acheulean

About 12000 artifacts have been discovered during the extensive excavation of the site of Garba I, dated at 0.5 m.y. This is a living floor localized inside a dried lateral stream of the main Awash River and attributable to the Upper Acheulean. The same cultural phase has been however identified also in other localities of Melka Kunture.

Lithic tools are characterized by a high frequency of handaxes made on large and very thin flakes, of an oval or ellyptical shape, together with a rather similar high frequency of cleavers, equally thin in thickness, showing either parallel (U-shaped) or convergent lateral edges.

This type of tools, technologically very well refined, has been quite often reutilised as a side scraper, through a resharpening of one of the lateral edges. Since few "debitage" has been found in the site, it appears evident that the manufacturing of handaxes and cleavers was done elsewhere, probably nearby the same raw material source. In the site of Garba I a variety of small-sized tools on flakes are present, generally made on obsidian.

The first suggestions of a possible control of fire and the first appearence of red ochre go back to the period of Garba I.

The preservation of faunal remains is very scarce at Garba I. The bones are highly fragmentary and often avoid identification.

As a general interpretation of some technological and cultural features of Melka Kunture, this aspect has been considered as a characterising pattern of meat consumption at an advanced Upper Acheulean epoch.

The Final Acheulean

The extensively excavated site of Garba III, approximatively dated between 0.25 and 0.15 m.y., represents in the cultural sequence of Melka Kunture the final phases of the Acheulean, and in some way, a transitional moment towards the Middle Stone Age. The living floor was organized, even at this time, within a small dried lateral branch of the paleoAwash River.

The lithic typology of this site shows the same kind of tools already met before; obsidian handaxes are however already miniaturised, as will be the standard during MSA. Tools on flakes are now predominat, with abundant side scrapers and well represented artifacts of Middle Paleolithic type, such as small bifacially retouched tools, end scrapers, borers, etc.; the Levallois technique is still very rarely used.

Three human remains found in this site belong to an archaic *Homo sapiens.*

4.4. The Middle and Late Stone Age and tfie latest phases of the prehistory at Melka Kunture: Kella I, Wofi III

The transitional archaeological evidence towards MSA from Garba III, together with a few other finding relatable to this same period, represent up to now at Melka Kunture the only MSA occurrences, which is otherwise, in Eastern Africa, rather well known.

As far as LSA is concerned, the excavation carried out at Kella have addeed a few informations about this cultural period; Lithic industry is rich in burins, blades and flakes; pottery is rare, while microburins are virtually unknown.

It seems difficult however, on the base of this rather limited information, to advance any comparison with other ethiopian contemporary sites where the LSA is far well documented.

The site of Wofi III, with lithic material and pottery sherds englobed in Holocene sediments, could be of historical age.

5. The explanation of cultural changes. Continuity and changes in Early Pleistocene archaeological records.

The long sequence of Melka Kunture allows a punctual recontruction of the most ancient phases of

ethiopian highlands Early Stone Age and give the possibility, at the same time, to establish a useful cultural framework to be compared either with similar and contemporary archaeological occurrences in the same highlands, as for example Gadeb, or in a more general way, with other Plio-Pleistocene East African sites, such as Olduvai Gorge in Tanzania and Koobi Fora in Kenya. Important comparisons can also be established with some newly discovered sites in Ethiopia such as Fejej, for the most ancient period, and Konso Gardula, as far as the beginning of Acheulean is concerned.

Particularly, the two largely parallel sequences of Olduvai and Melka Kunture have been interpreted in divergent ways, especially in regard to the explanation of the transitions between Oldowan and Acheulean, of their eventual interactions and of the possibility of interpreting this transition in terms either of continuity (even through many important changes) or as two totally independent cultural and paleoanthropological lines.

Moreover, the association of *Homo erectus* remains with Oldowan and Developed Oldowan assemblages at Melka Kunture contrasts with the evidence from Olduvai, where the most archaic complexes seem to be frequently associated to *Homo habilis* while *Homo erectus* appears relatively later (not before 1.2 m.y.) in the Olduvai sequence.

Finally, if the absolute chronology of the early Acheulean site of Konso Gardula will be confirmed, it seems highly interesting to advance some hypothesis on the contemporaneity between early Acheulean and Developed Oldowan sites as, for example, Garba IV, and in a more general way, on the exact meaning of the terminology up to now adopted for the initial phases of Early African Paleolithic.

Explanation of cultural changes and of the interactions between Plio-Pleistocene complexes represent some of the major problems in African Prehistory.

Long sequences such as Olduvai and Melka Kunture show a cultural change from living sites dated between 1.9/1.5 m.y. with lithic assemblages whithout handaxes and with predominantly tools on pebbles, to other sites characterized by a continuous increasing number of handaxes and cleavers and by the production of medium to large-sized flakes; the latter will be preferentially used for the manufacturing of handaxes and cleavers, with a consequent reduction of their thickness; medium to small-sized flakes will be very often retouched and transformed in regular and typologically well defined different kind of tools.

At Olduvai, the superimposition and interstratification of Oldowan and Developed Oldowan A and B living soils with other Acheulan occupation floors, suggested to M.D. Leakey the hypothesis that culturally different human groups were alternatively occupying the shore of the ancient lake. The different Oldowan and Acheulean techno-complexes would not have shared any kind of interactions, as two parallel but clearly different and separated phyla.

The contrasting interpretation of the Melka Kunture evidence shows on the contrary a general continuity in the development of technological and other cultural changes between the end of Oldowan times until the early Acheulean.

Slow and independent modifications of several features which represent the cultural aspects of the living sites (choose of the emplacement of the site, organization of the inhabited surface in areas devoted to peculiar activities, as for ex. Uthic manufacturing process, butchering and consumption of animals, different degrees of fragmentation of faunal remains, etc.) took place in different times, but no interruptions are evident within thisgeneral continuity.

This is particularly evident in the slow modification of the tool assemblage which doesn't show any real gap during its changing from Oldowan to Acheulean pattern.

Cultural changes suggest therefore at Melka Kunture a clear impression of graduality, following a pattern of moss ic evolution characterized by a not synchronous transformation of different features.

The most important consequence c f this interpretation consists in considering that this essential behavioural continuity also corresponds to the paleoanthropological evidence at Melka Kunture: human remains associated to the Oldowan at Gombore I and to the Developed Oldowan at Garba IV have been both referred to *Homo erectus.*

This species, at least at Melka Kuntuie, is therefore the only responsible of the cultural changes and behaviouraI patterns in the period comprised between about 1.7 and 1.4 m.y; by the way, Melka Kunture also provides one of the most ancient evidence *of Homo erectus* in the African continent.

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Marcello Piperno
Turin University