

## The Emergence of the Acheulean in East Africa – International Workshop, Rome, “La Sapienza” University, September 12–13, 2013

The end of the Oldowan and the origin of the Acheulean are still controversial topics. In East Africa, there is solid geochronological evidence pointing to the emergence of the Acheulean between 1.76 and 1.4 Ma. New approaches to lithic collections, including analysis of lithic technology, are questioning previous typological definitions. Doubts have also arisen on the continuity between Oldowan and Acheulean, and on the hypothesis that the Developed Oldowan coexisted with the early Acheulean. This has wide implications outside Africa, as Acheulean techno-complexes are also found in Europe and Asia.

The workshop “The Emergence of the Acheulean in East Africa,” organized by Margherita Mussi and Rosalia Gallotti, was held at “La Sapienza” University of Rome on September 12–13, 2013, assembled researchers currently doing fieldwork in East Africa. The meeting enabled them to present new data on ongoing research, share their experiences, and discuss open issues. A key topic of discussion during the workshop was the degree of influence that variability in theoretical approaches had on modeling the emergence and development of Acheulean technology and related cognitive capabilities as well as how these different approaches could be combined for the mutual benefit of all.

The workshop was also organized to mark the 50th anniversary of the discovery of Melka Kunture, Ethiopia (1963–2013), a site with an extraordinary archaeological sequence from the Oldowan onwards, where the emergence and development of the Acheulean is particularly well documented. The former Director of the French Archeological Mission at Melka Kunture (1965–1981 and 1990–1995), Jean Chavaillon, passed

away in December 2013. He had been one of the pioneers and most influential figures in the studies of early African prehistory. This report and the forthcoming proceedings are intended to honor his contribution to understanding the earliest human cultures, and his dedication and commitment to Ethiopia.

The first session of the workshop was devoted to Melka Kunture. Margherita Mussi, Director of the Italian Archeological Mission at Melka Kunture and Balchit since 2011, presented an overview of the history of research and new perspectives. Jean-Paul Raynal (Bordeaux), presented the revised chronostratigraphy and an evaluation of site formation processes, with an emphasis on the Lower and Middle Pleistocene. Raymonde Bonnefille (CNRS) discussed the revision of the palynological analysis she had first made in the 1970s. Rosalia Gallotti (Bordeaux) closed by presenting a detailed analysis of the early Acheulean assemblage of Garba IVD (~1.5 Ma) as well as technological trends between 1.7 Ma and 0.8 Ma. The Garba IVD complex reflects the development of technical innovations also seen at contemporary East African sites: 1) a specific *chaîne opératoire* for the production of large flakes to be potentially turned into Large Cutting Tools, 2) prepared methods for large flake detachment, and 3) wide variability in small *débitage* modalities and the emergence of some degree of predetermination.

Next, Manuel Domínguez-Rodrigo (Complutense) discussed general methodological issues, underlining that the interpretation of Acheulean sites is frequently flawed by methodological and theoretical problems: absence of a precise terminology, coexistence of different approaches

in lithic studies, dominance of technological/typological studies over a more holistic approach, scarce attention to taphonomy, as well as absence of behavioral modeling.

Pierre-Jean Texier (Bordeaux) illustrated the main sites of the Nachukui Formation (West Turkana), from Lokalelei 2C (2.34 Ma) to Kokiselei 5 and Kokiselei 4 (1.8–1.76 Ma), also providing comparisons with Isenya (0.7–0.6 Ma). This made it possible to place the eventual development of the bifacial concept in a broad chronological perspective. Bifacial shaping appears in West Turkana at 1.76 Ma at Kokiselei 4 and fits with a new concept of hard-rock working. Different units and volumes of the same raw materials utilized in the Oldowan start to be worked, while new techniques were implemented, adding complexity to those already mastered.

Yonas Beyene (French Center for Ethiopian Studies) described the Lower Pleistocene chronostratigraphy of Konso (southern Ethiopia). This area has yielded more than 20 archaeological occurrences ranging from ~1.9 to 0.8 Ma. Pre-1.75 Ma assemblages are characterized by Oldowan technology, while many abundant occurrences of Acheulean span the time period from ~1.75 to <1.0 Ma. The earliest Acheulean assemblage at KGA6 (~1.75 Ma) is characterized by a combination of large picks and crude bifaces/unifaces made predominantly on large flakes. The raw materials are mostly local. From ~1.75 to ~1.25 Ma, artifact refinement, especially in handaxe outline, marks technological evolution and implies enhanced functions. Handaxes with advanced thinning and symmetry were discovered only in the uppermost levels, dating back to 0.8–0.9 Ma. Beyene suggested that

behavioral novelties were being established, paralleling the emergence of *Homo erectus* sensu lato. The post-1.0 Ma refined handaxes might be related to the transition from *Homo erectus* to later *Homo* species.

Sileshi Semaw (CENIEH) introduced the major sequence of Gona (Afar Depression, Ethiopia): Oldowan, Developed Oldowan, and Acheulean assemblages have all been excavated in a record starting at 2.6 Ma (EG 10-12). Several sites dated to ~1.7-1.6 Ma, including DAN-5, BSN-12, BSN-17 and OGS-12, yielded archaeological materials comparable to those of Konso. The assemblages include Large Cutting Tools, as unifacially- and bifacially-shaped crude handaxes and picks, as well as small-medium flake production. Additionally, at Gona the Developed Oldowan occurs later than the earliest Acheulean, and accordingly cannot be transitional to Acheulean proper.

Ignacio de la Torre (University College London) heads the OGAP (Olduvai Geochronology and Archaeology Project) team's current excavations in Middle and Upper Bed II at Olduvai (Tanzania). Recent fieldwork combines surveys for new assemblages with excavations at sites previously investigated by Mary Leakey, including HWKEE, EFHR, MNK, and FC West. Concerning the Developed Oldowan/early Acheulean debate, he was less assertive than Sileshi Semaw: in his opinion, and in the opinion of his co-authors, comparisons with Mary Leakey's assemblages do not lead to any clear-cut conclusion on the status of the Developed Oldowan at Olduvai Gorge.

New excavations at Olduvai by a different team (Olduvai Paleoanthropology and Paleocology Project-TOPPP) enabled Manuel Santonja (CENIEH) and co-authors to revise the record from TKLF in Upper Bed II, with an estimated age of ~1.3 Ma. Mary Leakey originally identified the assemblage as Developed Oldowan, but later changed the attribution to the Acheulean, which Ignacio de la Torre and Rafael Mora (Barcelona) confirmed some years afterwards. The techno-typological study of nearly 6,000 lithics from the new excavations definitely ascribes this site to the Acheulean techno-complex.

David Braun (Cape Town) described landscape-scale patterns in the use of technical forms. Analyses of variation in tool forms at several sites at Koobi Fora, Kenya (1.4-1.5 Ma) and at Elandsfontein, South Africa (1.6-1.1 Ma), suggest a distinctive Acheulean pattern in the distribution of artifacts in the landscape. This, in turn, might reflect specific technological and behavioral strategies.

The African human fossil record between 1.8 and 0.8 Ma was discussed by Roberto Macchiarelli (Poitiers), who pointed out that we need a better understanding not only of the historically debated taxonomic and phylogenetic issues, but also of the extent of intra-taxic variation, including the degree of sexual dimorphism and of life-history patterns, which can be now assessed by high-resolution, non-invasive analytic approaches.

Jean-Paul Raynal and Naama Goren Inbar (Hebrew University) extended the discussion beyond East Africa. Raynal, who excavates open-air sites in the area of Casablanca (Morocco), focused on Thomas Quarry I, unit L. This unit, dated to ~1.4-1.0 Ma, yielded the earliest Acheulean evidence so far discovered in North Africa in stratigraphic context. The industry has been classified as early Acheulean because of the finds of trihedral and bifacial objects. It also contains spheroids, sub-spheroids and a wide variety of polyhedra, polyhedral cores, discoid cores and hammerstones, all in quartzite. Small flint pebbles were knapped with bipolar reduction techniques to produce small flakes. Many aspects of the lithic production point to technological traits shared with the Middle East African Acheulean.

Naama Goren Inbar illustrated the rich archaeological record of the Levantine Corridor, starting around 1.6 Ma at 'Ubeidiya. African, Asian and European elements are all found in the faunal assemblage. The extraordinary preservation of fruits, seeds and other perishable evidence at Geshert Benot Ya'akov (0.9-0.8 Ma) allowed interdisciplinary research and produced a detailed environmental reconstruction. The latter is required to get an insight into adaptive and evolutionary processes taking place outside Africa. The landscape was

quite different from the savannah that is commonly assumed to have favored human expansion.

During the discussion of the formal presentations, the participants also addressed the following issues:

- techno-economic innovations occurring between 1.76 and 1.4 Ma in East Africa, which are related to the emergence of large flake production and to the manufacture of Large Cutting Tools, as well as to the adoption of predetermined/prepared methods in small débitage;
- raw material provisioning systems, which are mainly based on local secondary sources, just as in the Oldowan;
- technological activities showing intra- and inter-site technological variability, in turn probably linked to behavioral choices in different ecosystems, rather than to different technological traditions;
- the coexistence of two technological traditions, i.e. the Developed Oldowan and the early Acheulean, which is still an open issue at Olduvai;
- the emergence of the Acheulean as related to the emergence of *Homo erectus* sensu lato, taking into account that at Olduvai the status of *Homo habilis* has not yet been thoroughly assessed.

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Margherita Mussi  
Dipartimento di Scienze dell'Antichità,  
"La Sapienza" University of Rome  
margherita.mussi@uniroma1.it

Rosalia Gallotti  
Université Bordeaux 1, PACEA-PPP  
(France)

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