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Anthropogeny: The Perspective from Africa

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Chairs:

Berhane Asfaw, Rift Valley Research Service & **Lyn Wadley**, University of the Witwatersrand

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ABSTRACTS

Australopithecus in East and South Africa

Job Kibii, National Museums of Kenya

Australopithecus is a genus of hominins whose evolutionary evidence is confined to the African continent. The genus evolved in eastern and/or southern Africa around 4 million years ago, eventually becoming extinct slightly less than two million years ago. *Australopithecus* is scientifically accepted as the common ancestor of the *Paranthropus* and *Homo*. Scientists recognize five species of Australopithecines; *Australopithecus anamensis*, *A. afarensis*, *A. africanus*, *A. garhi*, and *A. sediba*. Their relationship to each other and the earliest form of *Homo*, *Homo habilis*, remains controversial due to the sparse fossil record in Africa. There are two main ways of expressing evolutionary relationships: phylogenetic trees and cladograms. This presentation will explore current fossil evidence regarding members of the genus *Australopithecus* and their phylogenetic and cladistic relationships.

The Chad Basin

Andossa Likius, University of Moundou (Chad)

Until recently, Chad has remained a poorly known country as far as paleontological research, compared to its neighbors on the African continent. But since 1994, the Mission Paléoanthropologique Franco-Chadienne (MPFT) is conducting intensive geological and paleontological surveys in the Djurab Desert. More than 400 Mio-Pliocene fossil sites dated between 3 and 7 million years ago (mya) have been identified. These sites have yielded rich and diverse fossil faunal assemblages of vertebrates, unique in Central Africa. They include the remains of early hominins: Abel (*Australopithecus bahrelghazali*, 3.5 mya), the first *Australopithecus*, discovered west of the Rift Valley (Brunet et al., 1995 & 1996), and Toumaï (*Sahelanthropus tchadensis*, 7 mya), the earliest known hominin (Brunet et al., 2002 & 2005). These discoveries, exceptional in their geographical position and their dates, substitute the old scenarios explaining the emergence of the human family through environmental changes in East Africa (Coppens, 1983).

The Archaeology of Konso-Gardula

Yonas Beyene, Association for the Conservation of Culture and CFEE (Ethiopia)

Early Pleistocene archaeological sites of East Africa have provided us with a wealth of data that is unparalleled anywhere else. The earliest Oldowan and Acheulean industries have been respectively dated to 2.6 mya and 1.75 mya. The “transition” between the Oldowan and Acheulean technologies and the dynamics that are associated with it are addressed through paleontological and paleoecological studies. At Konso, both *Homo erectus* and *Australopithecus boisei* remains are found at the 1.4 mya level, suggesting divergent adaptive strategies of the two species lineages.

The shift from the simple core-flake technology called the Oldowan to the knapping of large flake blanks off from large boulders is evidenced at at least at two sites, notably at Konso-Gardula in south Ethiopia and at Kokiselei, west of Lake Turkana, Kenya. At Konso-Gardula, it was demonstrated that the knapping of large flakes from mega-cores and shaping of large cutting tools (LCT) had started by 1.75 mya and showed important technological changes thereafter. This is seen at various localities until 0.8 mya, spanning the crudest forms of LCT shaping to the finely made 3D symmetric bifaces.

Acheulean assemblages were recovered from four major time periods at Konso, demonstrating considerable technological changes across time. At 1.75 mya, the earliest LCTs are represented by large flakes, picks, unifacial handaxes and cleavers; a more typical early Acheulean first occurs at 1.6 mya and diversifies by 1.4 mya; finally, classical Acheulean assemblages with finely made bifaces emerge by 0.8 mya. Excavations made in the earlier Konso succession (1.75 – 1.4 mya) have resulted in the discovery of both Mode I and Mode II assemblages suggesting the coexistence of both technologies at Konso, while, at the same time, development of the Acheulean technology was in full action.

The Origin and Development of Fire Technology in Africa **Lyn Wadley, University of the Witwatersrand (South Africa)**

Fire has traditionally provided humans with light, warmth, social comfort, protection from predators, and the ability to cook and process a variety of useful products. When did humans first recognise the advantages rather than the dangers of fire? When did people learn to control and reproduce fire instead of using it expediently? Sophisticated fire technology was known to *Homo sapiens*, but archaeological evidence implies that fire could be used at will by hominins in Africa long before modern humans took control of the landscape. The ability to cook food and extract nutrients easily may even have played a role in hominin evolution, allowing smaller teeth and gut, and larger, more expensive brains.

So, Where Do We Come From? **Himla Soodyall, University of the Witwatersrand (South Africa)** **and the Academy of Science of South Africa (ASSAf)**

European paleoanthropologists developed the behavioral modernity metaphor in the 1970s when it became clear that the archaeological record for human origins in Europe 45,000 years ago differed from that found with older “archaic” humans in Africa and Asia. Since then, archaeologists have defined behavioral modernity strategically, varying diagnostic criteria to draw attention to one or another kind of evidence. Many have cited the use of projectile weaponry as evidence for modern human behavior and cognition, but changes in projectile weaponry do not correlate with any major inflection point in human evolution. This should surprise no one, because the projectile technology-behavioral modernity link rests on little or no prior theory. Archaeologists developed it after-the-fact to explain early evidence for projectile technology. Rather than focusing on behavioral modernity, paleoanthropologists should focus on behavioral complexity. Complexity is a metaphor, too, but it is also a statistically-measurable property of any quantitative evidence. The stone tool record begins to exhibit increasingly complex variability after 0.2-0.3 million years ago, during a period correlated with *Homo sapiens* origin and dispersal. This complex variability most likely reflects an evolving relationship between technology and spoken language – a uniquely derived human behavior, that intensified as humans became Earth’s only obligatory tool-using primate.

Assessing Claims for the “Earliest” *Homo sapiens* **Berhane Asfaw, Rift Valley Research Service (Ethiopia)**

The definition of *Homo sapiens* has been a matter of debate among researchers in human evolution for centuries. Recently, a qualifier has been added to the species name, “modern”. This addition denotes that there are some *Homo sapiens* who are not modern. This explains that the species we are dealing with is an evolving species lineage and we are therefore arbitrarily naming a segment of this evolving lineage as “modern” *Homo sapiens*. The fossil record for all hominins is very incomplete. As we get closer in time to the present, especially in the Middle Pleistocene, the record is inadequate. Most of the hominid fossils assigned to *Homo sapiens* are very fragmentary and poorly dated, which makes it

difficult to infer phylogenetics upon which taxonomic assessment should be based. Despite these shortcomings of the fossil record, the geographic origin of the species *Homo sapiens* in Africa is widely accepted. This understanding is rooted in DNA-based studies, the fossil record, and extrapolation from archaeological assemblages. As it has been repeatedly demonstrated, cultural changes do not go hand in hand with the anatomical or genetic changes. However, it has been insinuated by some that the appearance of the Middle Stone Age heralds the emergence of *Homo sapiens*. What is the meaning of that industrial complex, and how do the fossil hominids associated with it reveal to us?

Klasies River as a 120,000 Year-Old Archive of Human Behavior in South Africa **Sarah Wurz, University of the Witwatersrand (South Africa)**

Klasies River main site was a favored home base for southern Cape humans between 120 000 and 2300 years ago, leading to the build-up of more than 21 meters of superimposed shell middens. The fossils of early modern humans preserved within the deposits provide a unique glimpse into the appearance of human ancestors from the southern Cape coast and on aspects of their behavior. The extensive midden deposits show that hunter-gatherer-fisher groups visited the site throughout the climatic and environmental fluctuations of the last 120 000 years. They responded dynamically and flexibly to such changes by adapting their subsistence behavior and technologies. Similar plasticity and complexity are evidenced in their stone tools and the utilization of pigments. The extent of the well-preserved archaeological remains, evidence for the early utilization of marine resources, dynamic responses to changing contexts and cultural ingenuity, bear testament to early human ancestors' expert abilities to thrive in the Stone Age. The Klasies River archive highlights the achievements of early African populations and the role that they played in the development of humankind.

The View from West Africa **Abdoulaye Camara, Cheikh Anta Diop University of Dakar (Senegal)**

In terms of discoveries of human palaeontology and prehistory, West Africa seems to be the "poor relative". No hominid anterior to our species has yet been found; only stone tools have been discovered, the only witnesses of an old settlement of this part of the continent.

The oldest lithic industries are included or related to Quaternary levels of the Middle Pleistocene. Some researchers have attributed to Oldowan culture to some pebbles discovered in unstratified levels, others have claimed Pre-Acheulean characteristics for tools on pebbles and flakes not accompanied by typological shapes characteristic of the Acheulean: the handaxe and the cleaver.

Archaeological discoveries show that ancient Paleolithic presence across West Africa. Two zones of concentration and dispersion of the old lithic industries are apparent:

In the North, in Saharan and sahelian regions (Mauretania, Senegal, Mali, Niger, and Burkina Faso) the desert environment favors discovery of artefacts. In the South, in Guinean and equatorial region, where the heavy vegetation complicates the discovery of stone tools, that are mostly found along riverbeds.

Since 1980, national and international research programs have begun to search for prehistoric settlements. These have allowed to

- to correlate geomorphological and stratigraphical observations associated with geological formations,
- to attribute lithic industries to better characterized sedimentary layers,
- to take different samples for analyses and interpretations to obtain relative datation (correlation between geomorphological observations and oxygen-isotope records (marine cores off the Mauritania and Senegal coasts by Camara and Duboscq, 1984, 1987) , or absolute datation (optically stimulated luminescence, OSL dates) necessary for a stratigraphic and chronological framework of the Quaternary' formations.

This research, although localized, already allows a better vision of the prehistoric occupation in the different regions of West Africa during the Quaternary.

Behavior and Settlement Patterns in Coastal Stone Age Communities – Evidence from Stable Isotopes

Judith Sealy, University of Cape Town (South Africa)

Coastlines offer rich resources for hunter-gatherers: abundant food, raw materials for making artefacts, possible routes for dispersal and much more. Were coastal areas therefore important in human evolution? Opinions have gone back and forth over the years. In the second half of the twentieth century, most researchers thought that aquatic resources became important late in prehistory, once populations had grown so that additional sources of food were needed. Today, different perspectives are being offered, with some researchers suggesting that coastal adaptations may have played a role in the emergence of modern humans. Coastal food resources are relatively abundant, but spatially restricted. Did foraging in this landscape promote the high level of social interaction characteristic of our species? Did early modern humans use seafoods only occasionally, or did they focus on them intensively, like many recent coastal populations? One of the difficulties in answering these questions is that coastal sites are rarely well preserved over very long timespans, due to changes in sea level and tectonic activity. The southern African coastline has, however, remained unusually stable over the last several hundred thousand years, with many well-preserved coastal sites. We find more evidence of seafood in recent sites, but is this due to greater consumption or better preservation? From the isotopic composition of archaeological bones and teeth, we can reconstruct aspects of peoples' diets and how they used the landscape, and infer some features of the way societies were organized. We cannot yet answer all these questions, but we are making progress!