ANT-202 Fact Sheet Week 2 September 29, 2014

II Archaeology

B Dating and Divisions of Time

5 Dating methods

a Historic records.

b Dendrochronology

c Radiocarbon dating

d Potassium-argon dating

III Processes in World Prehistory

A Biological evolution

1 Natural Selection: In the struggle for survival, those organisms most well adapted to prevailing conditions will pass on their superior characteristics to succeeding generations with more frequency

B Colonization

C Adaptation

D Technological innovation

E Increasing social complexity

IV Beginnings: Africa

A Biological classification of humans and their ancestors

Order: Primates – which includes all lemurs, monkeys, apes, humans, and human ancestors.

Family: Hominidae—Gorillas, chimps, Human and human-like ancestors represented in the fossil record back to ca. 6-7 million years ago.

Tribe (Subfamily): Hominin-- Human and human-like ancestors represented in the fossil record back to ca. 6-7 million years ago. Defined by **BIPEDALISM**

Genera: There are four hominin genera that we will be mentioning from oldest and most ape-like to youngest they are:

Sahelanthropus

Ardipithecus

Australopithicus

*Homo (*Human*)*

B The Fossil Record of the earliest hominins (Pre-*Homo*)

1 *Sahelanthropus tchadensis* Reported by Michel Brunet. The fossil consists of a remarkably complete skull (cranium). Much less prognathic profile, small canines and many other traits of the teeth distinguish it as a hominin not an ape. Small cranial capacity (380 cc) Dated 6-7 MYA based on

association with time-diagnostic non-hominid fossils (index fossils).

2 *Ardipithecus ramidus* Found in the Awash area of the Great Rift Valley in Ethiopia. Dated 4.4 MYA . Reported by Tim White from U. C. Berkeley who argues that the species was bipedal but also spent a lot of time in trees. Known as “Ardi” Cranial capacity: 350 cc

3 *Australopithecus* : Defining features : 1) bipedalism; 2) small brains; 3) large cheek teeth

a *Australopithecus afarensis* (Lucy) 40% complete female found at Hadar in the Rift Valley in Ethiopia . It is approximately 3.2 million years old. Discovered in 1974 by Donald Johanson.

i Traits:

(a) Considerable size variation;

(b) Bipedal, but with robust curved arms usually associated with tree climbing

(c) Very prognathous profile- Human-like hands

(d) Brains were chimpanzee size; Lucy was 415 cc.

ii Laetoli: At this site in Tanzania in the southern Rift Valley Mary Leakey found three sets of footprints dating about 3.5 million years ago--probably left by Australopithecines. Found in 1976, dated by potassium argon. Demonstrate bipedal walking.

b Split in the tree

i Gracile line: *Australopithecus africanus* (3.0-2.5 MYA) Taung baby, Taung Limestone Mine South Africa 1925 (reported by Raymond Dart) Acceptance stalled by Piltdown Man

ii Robust line (3-1 MYA): In contrast with *A. africanus* this is a line of very robust (larger, more thickly boned, with big teeth and heavy jaws) Australopithecines, represented by two similar species. They had heavy builds and specialized teeth used for chewing coarse plant foods. Sometimes referred to as *Paranthropus*

c *Australopithecus garhi* 2.5 MYA. Found by Tim White appears to be associated with animal bones that were butchered with stone tools.

C The Artifact Record*:* An important aspect of the discovery of *A. garhi* was the apparent association with the first stone tools. Until this discovery, most scholars associated the first tools with ***Homo*** -- although Raymond Dart and later Robert Brain had argued for Australopithecine tool use on the basis of finds from Swartkrans. The tools found at Gona and at Oldavai were what are called **pebble tools**, or sometimes **cobble tools**. They were simply large pebbles that were struck with another harder stone (a **hammerstone**) to remove flakes. The large piece of stone from which the smaller flakes are removed is called a **core**. The stone used to strike the core is called a hammerstone. This pebble industry was labeled the Oldowan, by Mary Leakey after Oldavai Gorge, where it was first defined. The Oldowon assemblage marks the beginning of the Paleolithic—the era of stone tools. The earliest segment of the Paleolithic is the Basal Paleolithic dating 2.5—1.8 mya based on finds from Kada Gona (Gona River) (Olduwan tools dating ca. 2.5 mya)

D Lifeways: Alternate interpretations

1 Raymond Dart's " Killer Ape" hypothesis"—that Australopithecines hunted and killed animals and ate their flesh.

2 Scavenging hypothesis. C. K. Brain

V *Homo*

A Original defining traits of *Homo*:

1 Cranial capacity: ≥600 cc

2 Less prognathic

3 Early *Homo*, *Homo habilis*, was first recognized by the Leakeys at Oldavi Gorge in the 1960s, where it dates to about 2.5-2.0 MYA. In the same layer were stone tools. Name means handy person.

A. afarensis	*A. africanus*	*Homo habilis*
4.0-3.0 mya	3.0-2.5 mya	2.5-2.0 mya
Brain 380-500 cc	Slightly larger brain 435-530 cc	≥ 600 cc
Very prognathic	Less prognathic,	Less prognathic

VI Out of Africa: Middle *Homo (Homo ergaster Homo erectus and the Dmanisi skulls)*)

A Classification of species: *Homo ergaster* is present in Africa—about 1.8 million years ago. *Homo ergaster* is very very similar to *Homo erectu*s that appears in Asia almost the same time (1.8 MYA) The two are sometimes referred to as "Middle Homo"

B *Homo ergaster* traits:

1 Generally very robust

2 Cranial capacity of 800-1000 cc

3 Massive supraorbital tori (brow ridges)

4 Thick cranial wall

5 Almost no forehead—low and sloping

6 No chin

7 Almost fully modern post-cranially (below the neck)—indistinguishable from modern humans

C Climate and environment

1 Effects of Pleistocene glaciation:

a Glacial coverage

b Sea levels lower than present

D Classification of Stone Tools

1 Basal Paleolithic : 2.5 (Gona River central Ethiopia) –1.8 million Olduwan Pebble tools (and flakes) only –*Homo habilis* and *Australopithecus garhi*

2 Lower Paleolithic is defined by Acheulian hand axes and non-handaxe (choppers)– the tools associated with *Middle Homo* begin at 1.8 million and continue to dominate assemblages up to about 200,000 years ago

3 *The Fossil and Artifact Records*

a Africa: The oldest *Homo ergaster* finds are from Lake Turkana in northern Kenya, dating 1.6-1.8 MYA—found by the Leakeys.

b SE Asia

i Java:

(a) Trinil site. Java Man. Eugene Dubois 1890s found a tooth, a skullcap, and a thigh bone (femur). The dating of this site is very uncertain. Most people think between 0.8 And 1.0 MYA, but it may be 1.7MYA, based on a newly obtained potassium argon date. The brain size of the specimens is about 900cc.

(b) The Sangiran site. Poorly dated, but some parts of this site are 1.8My by K/Ar dating. Jaw, skull with teeth, juvenile jaw, child's skull cap). No definite tools have been found yet at Sangiran.

c China.

i Zhoukoudian Clearly Homo erectus known as Beijing (Peking) man. Dated to around 0.6-0.4 MYA by several methods. Brain size average of 1000cc.The teeth are intermediate in size between those of early Homo and Homo sapiens The postcrania, including pelvis and femur, is totally modern. Zhoukoudian fossils lost during WWII.

d SW Asia: The Dmanisi Skulls and their Implications

i 5 Skulls , discovered by David Lordkipanidze

ii Carnivore den

iii Skull 5: Adult Cranial capacity only 546 cc

e Europe (*Homo Heidelbergensis*)

i Mauer site, Germany. A mandible usually called the Heidelberg jaw 0.5 millon. Also known as *Homo Heidelbergensis* (Archaic or Transitional)

ii Gran Dolina, Atapuerca region, northern Spain reported in 1995-- about 0.8

million years old. Mostly stone tools and (flakes) and faunal remains—with the remains of 5 or six hominins (Archaic or Transitional)

iii Sima de los Huesos (The Pit of Bones), Atapuerca region, northern Spain, over 30 human skeletons dumped in a cave-dating 350,000-500, 000 B.P.

iv Clacton in England – 0.25 million non Acheulian hand axes and choppers.

v Ambrona and Torralba, Spain 0.4-0.2 MYA, hand axes and elephant bones

E Lifeways of Middle *Homo*

1. Fire—800,000 Gesher Benot Ya'aqov (GBY), Israel – An Israeli team

2. Clothing.

3. Improved stone tool technologies. Acheulian hand axes and Clactonian choppers show some refinement.

4. Wooden spears recovered from a site in Germany (Schoningen) (0.4 million years old) Meat would have been an important resource in the northern latitudes in the winter when plant foods are not available.

5. Gender division of labor

6. Food sharing and mutual cooperation within groups.

7. Pair –bonding ?

8. Incest taboo

9. Cannibalism ?