ANT 3514- Introduction to Biological Anthropology

Plio-Pleistocene Hominids

Lab 9, Week of 3/14/05

The focus of this lab is gracile and robust Australopithecines and "early *Homo*". As such, we will be comparing specimens of the subfamily Australopithecinae with those of the early members of the subfamily Homininae. The genus *Homo* emerges approximately 2.4 m.y.a., and as we will see these fossils possess both ancestral and derived morphological traits.

STATION 1 – Gracile vs. Robust "Australopithecines" (pgs. 213-216, 218, 228, and 245 in your textbook)

This station focuses on the similarities and differences between the gracile and the robust Australopithecines. At this station you will find:

- Composite cranium of *Australopithecus afarensis*
- 2 crania of *Paranthropus robustus* (A6, A28)
- a mandible of *Paranthropus boisei* ("Peninj")
- 2 crania of *P. boisei* (KNM-ER 406 and OH 5)
- a cranium of *Paranthropus aethiopicus* (KNM-WT 17000 – "The Black Skull")

The subfamily Australopithecinae (the Australopithecines) contains a gracile group and a robust group. These groups are differentiated based on differences in their ***cranial*** morphology. (Their postcrania do not necessarily conform to a "gracile vs. robust" distinction.)

(in class) **Complete the following table comparing the crania of these different australopithecines:**

	A. afarensis	*P. robustus*	*P. boisei*	*P. aethiopicus*
Cranial cresting (sagittal and nuchal)				
Degree of Prognathism				
Degree of Post-Orbital Constriction				
Size of anterior vs. posterior teeth				
Overall Robusticity (rank 1=most robust, 4=least)				

(at home) **What do the cranio-dental differences between the species noted above suggest to you about the subsistence strategies of robust and gracile Australopithecines?**

STATION 2 – Australopith Mandibular Anatomy

(in class) **Compare the mandibles of each species:**

	A. afarensis	*P. boisei*	*Pan troglodytes*	*H. sapiens*
Dental Arcade Shape (rectangular vs. U-shaped vs. parabolic)				
Canine Size (small vs. large)				
P3 form (1 or 2 cusps)				
Presence/Absence of Chin				

STATION 3 – Gracile Australopithecines and *Homo*

The focus of this station is to compare the differences between the gracile australopithecines and *Homo habilis*. At this station you will find:

- a cranium of (A73)
- a cranium of *Homo habilis* (KNM-ER 1813)
- *A. africanus* foot
- femur of *H. sp.* (KNM-ER 1481)
- articulated foot and a femur of a chimpanzee
- human femur

(in class) **List any post-cranial features from the *H. habilis* foot and *H. sp* femur that indicate bipedality. Use human and chimpanzee material for reference.**

(in class) **Complete the following table regarding the similarities and differences between the *H. habilis* and *A. africanus* crania:**

	A. africanus	*H. habilis*
Cranial Vault Height (short vs. tall)		
Overall Robusticity (most vs. least)		
Degree of Prognathism		
Shape of Face/ Zygomatics (flared vs. non-flared; broad vs. narrow; tall vs. short)		
Dental Arcade Shape (U-shaped vs. parabolic)		

(at home) **Can *A. africanus* conceivably be ancestral to *H. habilis*? Why or why not? Include morphological (from the specimens) as well as temporal and geographic elements in your answer. Reference boxes 6-2, 7-3, and 8-1 to support your answer.**

STATION 4 Robust australopithecines and *Homo*

The focus of this station is to compare the crania of the robust australopithecines and early *Homo*. At this station there is:

- crania of *P. boisei* (A27, A30)
- a cranium of *Homo habilis* (OH 24)
- a cranium of *Homo rudolfensis* (KNM-ER 1470)

(in class) **List all significant differences between the crania of the robust australopithecine to that of *H. habilis* and *H. rudolfensis* .**