

# LAB 1: Humans as Primates: Comparison of the Skeletal Evidence

Anthropology 151  
Fall 2007

Name \_\_\_\_\_  
Date \_\_\_\_\_

**INSTRUCTIONS:** Comparison of human skeletal remains with those of nonhuman primates and early hominids is a valuable technique for understanding the link between certain physiological and behavioral traits. This laboratory exercise is designed for you to investigate the relationship between skeletal structure and aspects of behavior including diet, locomotion, and bipedalism. With an understanding of relationships between skeletal structure and function you will be able to reconstruct the probable behavior of extinct hominids through the examination of fossil remains.

Feel free to discuss the questions with your classmates, the instructor, and TA, but fill out your own worksheet and turn it in next class.

## STATION 1. TRENDS IN PRIMATE EVOLUTION

Compare the following traits between the pig skull, the capuchin (a New World Monkey) skull, and the human skull:

- a) the size of the face (or snout) relative to the size of the *cranial vault*
- b) the positioning of the eyes
- c) the position of the spinal opening (*foramen magnum*)

How do these characteristics reflect the relative importance of the sense of smell among mammals and primates?

How do these characteristics reflect differences in **vision** among mammals and primates?

How do these characteristics reflect the differences in posture and locomotion between pigs, monkeys, and humans?

## STATION 2. LOCOMOTION

Compare the following traits between the human and chimpanzee skeletons:

- a) the shape of the spinal columns
- b) the position of the spinal opening (*foramen magnum*) on the skull, and the size of the *nuchal* lines (the place where the neck muscles connect to hold up the head)
- c) *the pelves* (especially their length)
- d) the feet (especially the big toe and arch)
- e) the hands
- f) the relative length of the limbs

How do these differences relate to posture and locomotion?

Which of these Hominoids is best adapted to an arboreal environment? a terrestrial environment? Why?

## STATION 3. HOMINID BIPEDALISM (*INNOMINATE COMPARISON*)

Compare the overall structure and size of these *innominates* (hip bones). The specimens represent a human, a human pygmy, a chimpanzee, and an australopithecine (early hominid).

On the basis of this evidence, do you think that australopithecines were bipedal? Why or why not?

## STATION 4. DIET

Compare the dentition of the chimpanzee, gorilla, human, and australopithecine.

Chimpanzees are arboreal and terrestrial omnivores that eat primarily fruit and small quantities of meat and insects. Gorillas are terrestrial foliovores that eat large quantities of low-nutrition, bulky, leafy, foods. Humans are considered to be omnivores with a very generalized diet. These feeding habits are reflected in dentition and jaw structure.

Compare the following traits:

- a) the shape of the *dental arcade*
- b) the size of the canines (is there a gap [or *diastema*] between the teeth for the canines to fit in when the jaw is closed?)
- c) the size of the molars
- d) the overall robustness of the mandible (is it strengthened by internal or external bone growth?)
- e) the size of the muscle attachments for the mandible

How do these differences in masticatory (eating) apparatus reflect differences in diet among chimpanzees, gorillas, and humans?

What kind of diet did the robust australopithecine probably have? What evidence supports your answer?

What kind of diet did the gracile australopithecine probably have? What evidence supports your answer?