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**ANT 3514 – Introduction to Biological Anthropology  
Human Osteology and Natural Selection  
LAB 1, Week of 5/09/05**

**NOTE:** Some of the following questions may require you to look up the answers at home using a textbook or an osteology website.

**STATION 1: Skull**

The skull (cranium and mandible) plays an important role in physical anthropology in terms of determining age, sex, race, and understanding evolutionary history.

Name the three sutures marked with dots.      Name the three cranial bones at this station.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_

**STATION 2: Vertebral Column**

Examine the vertebral column. The cervical, thoracic and lumbar vertebrae are movable. Meanwhile the sacrum and coccyx are fused vertebrae. They are part of the bony pelvis.

- a). In addition to being called the 1<sup>st</sup> and 2<sup>nd</sup> cervical vertebrae, these bones are also given specific names. What are they?
  
- b). Of the 3 aforementioned types of movable vertebrae, which type lies right above the bony pelvis?

**STATION 3: Pelvis**

The human pelvis is composed of 3 bones; the os coxae (left and right), sacrum, and coccyx. The pelvis serves to protect and support abdominal organs as well as anchor abdominal and leg muscles. In a forensic and paleontology context, these bones provide valuable information in determining sex.

- a). Which bones of the pelvis are fused vertebrae?

\_\_\_\_\_

- b). Using the diagram compare the os coxa provided with the articulated male and female pelvis. Is it male or female? **Justify your answer.**

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#### STATION 4: Upper Limb

Three bones make up the upper limb: the humerus, radius, and ulna.

Look at the anatomical specimen when answering the following questions.

- a). Which bone of the lower arm is on the same side as your pinkie? \_\_\_\_\_
- b). Which bone of the lower arm is on the same side as your thumb? \_\_\_\_\_
- c). Which bones form the elbow joint? \_\_\_\_\_  
(i.e., Which 2 bones allow you to bend the elbow?)

#### STATION 5: Lower Limb

The bones of the leg are the femur, tibia and fibula. As the longest, strongest, and heaviest bone in the skeleton the femur provides valuable information about an individual's stature.

- a). The fibula is on what side of the body (i.e., medial or lateral)? \_\_\_\_\_
- b). Examine the femur. Now, using the osteometric board in front of you determine the maximum length of the femur and enter it into the different stature equations in the table.

Maximum femur length \_\_\_\_\_ cm

Stature Formulae for the Femur (Male)

Racial Group	Equation in cm	Stature (in cm)	Converted stature (inches)
Caucasian	$2.32(\text{femur length}) + 65.53 \pm 3.94 =$	$\pm$	$\pm$
African	$2.10(\text{femur length}) + 72.22 \pm 3.91 =$	$\pm$	$\pm$
Asian	$2.15(\text{femur length}) + 72.57 \pm 3.80 =$	$\pm$	$\pm$

The above equations will give you answers in centimeters. You will need to convert your values into inches (1 cm = 0.3937 in) to complete the final column.

The following website will assist you: <http://convert.french-property.co.uk/>

Notice how the same length femur results in different statures for different racial groups.

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### STATION 6: Pathology

Examining bone pathology (disease) can provide insight into an individual's life and death. Read the following descriptions of different pathologies and match them with their respective bones.

**Achondroplasia** – abnormality in the conversion of cartilage to bone. It is the most common form of dwarfism characterized by shortening of limbs, large head and a highly curved spine.

**Fracture with Callus** – Following a fracture, the bone repair process forms a callus around the fracture site made up of new bone cells. If the bone is not set properly the callus can become quite large. This happens because the bone is trying to create a shape that allows function to be maintained.

**Anencephaly** – defective development of the brain, with absence of the bones of the cranial vault.

### Match Bone with Disease

Achondroplasia \_\_\_\_\_

Fracture w/ Callus \_\_\_\_\_

Anencephaly \_\_\_\_\_

### STATION 7: Label the following diagram.

