

Evolutionary Changes In Primates

Procedure

Part A. Skull Characteristics and Relationships

Ratio of Brain Area to Face Area

Rectangles over the skulls in Figure 25-1 represent the area of the brain (upper rectangle) and face area (lower rectangle) of each skull. Determine the area of each rectangle by measuring the length and width in centimeters and multiplying the two measurements together. In your notebook in a table similar to Table 25-1, record the brain and face areas of the three skulls.

Determine the ratio of brain area to face area of each skull by dividing the brain area by the face area. Carry the divisions to two decimal places. Always use face area as one in the ratio. For example, a skull with a face area of 120 and a brain area of 50 has a face area to brain area ratio of 1 to 0.41. Record the ratios in the proper column of the table.

$$\frac{\text{Face area}}{\text{Face area}} = \frac{120}{120} = 1$$

$$\frac{\text{Brain area}}{\text{Face area}} = \text{a number other than one; } \frac{50}{120} = 0.41$$

Cranial Capacity

Measure the diameter of the circle in each skull in centimeters. Multiply the cranial diameters by 200 cm³. This calculation gives a value equivalent to the cranial capacity (brain volume) in cubic centimeters. Record the cranial capacity of each skull in the table.

NOTE: This method of measuring cranial capacity differs from the method used when an intact skull is available.

The volume of sand that will fill the cranial cavity is the method used when an intact skull is available. The technique of multiplying by 200 is suitable only for these diagrams.

Jaw Angle (Prognathism)

In front of each skull are two heavy lines, one running parallel to the slope of the upper jaw and one running through the nose. These two lines are to be used for measuring how far the jaw protrudes forward.

With a protractor, measure the outside angle formed by the two lines in each skull (the angle toward the right).

Place the protractor onto each skull as shown in Figure 25-2. Read the angle by using the outside scale on the protractor. The angle is read where the lower skull line crosses the protractor. Record the angles in the proper column of the table.

Lower Jaw Shape A more protruding jaw has a smaller angle than a less protruding jaw.

The ratio between the distance across the jaw backs compared to the distance across the jaw fronts can be used to compare jaw shapes of the three jaws in Figure 25-3. Measure the distance across each jaw from one dot to the other on the back teeth. Measure the distance across each jaw using the dots on the front teeth. Record in the table the distances (in cm) for each jaw.

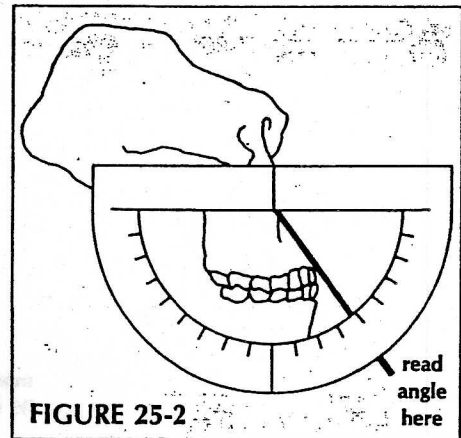


FIGURE 25-2

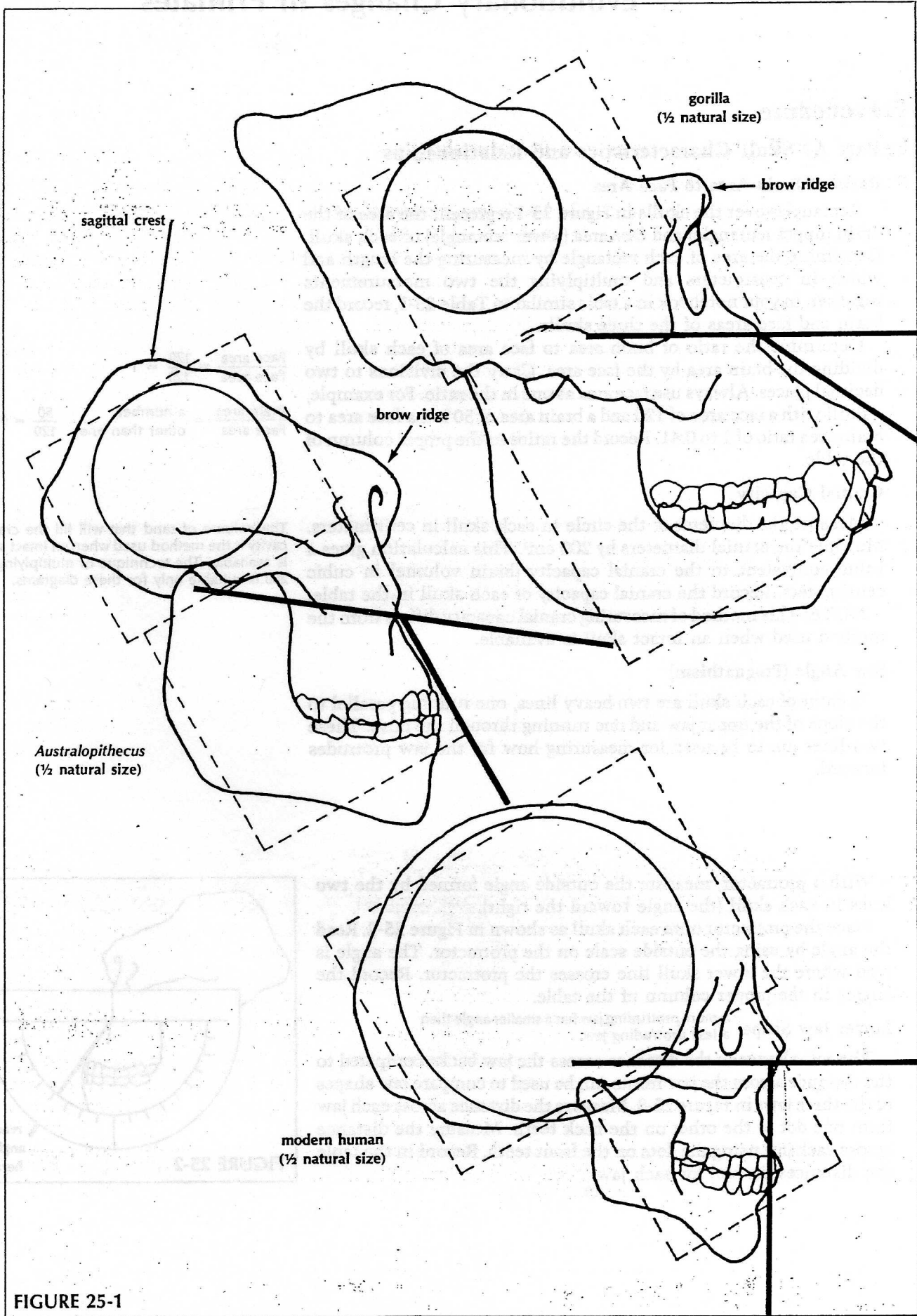


FIGURE 25-1

