

LESSON 4-2: MAKING NO BONES ABOUT IT!

A LESSON ON SKELETAL EVIDENCE

Archaeologists can tell a lot about a dead person's life by looking at all or part of the skeleton. (See Figures 28 A and B.) That is why archaeologists are sometimes asked to assist in solving crimes that occurred in the past. Because of their expertise with skeletal remains, they can often help identify the remains of people who have been dead for a long time. Many times they can determine age, sex, and some information about that individual's lifestyle.

Cartilage Before Bone

Most of the bones in humans develop from masses of cartilage that resemble the bones they will become. The cartilage in bone is gradually replaced with true bone. As long as cartilage is present in a bone, that bone can continue to grow. As people grow, their bones get longer and thicker. That is why an X-ray of a young person's wrist can help his or her physician decide if growth has stopped. If cartilage can be seen at the ends of the bones, there will be further growth; if no cartilage is present, the child has reached full stature.

Growing and Changing

All during life, minerals are deposited and removed from bone. During childhood and adolescence, the deposit of minerals occurs faster than mineral loss; therefore, bones grow. The average female grows until 18 years of age. In males, growth continues to 20 or 21 years. Between the years of 18 and 35, there is a balance of mineral deposit and loss, so bones stay constant in size. After age 35, bone loss exceeds bone gain.

In human adults, the ends of rib bones gradually change shape over the years. The sternal ends are rounded in young adults. These bones become cup-shaped and jagged with increasing age.

Pelvic Girdle Changes

In youth, the pelvic girdle consists of three bones: ilium, ischium, and pubis. These eventually fuse to form the pelvic girdle in adults. The pelvic girdle serves as an area of attachment for bones and muscles of the legs. Females have wider pelvises than males. This additional width is necessary for childbearing and childbirth. In females, the pubic arch is wide, and the bones are lighter and smoother. (See Figure 29.)

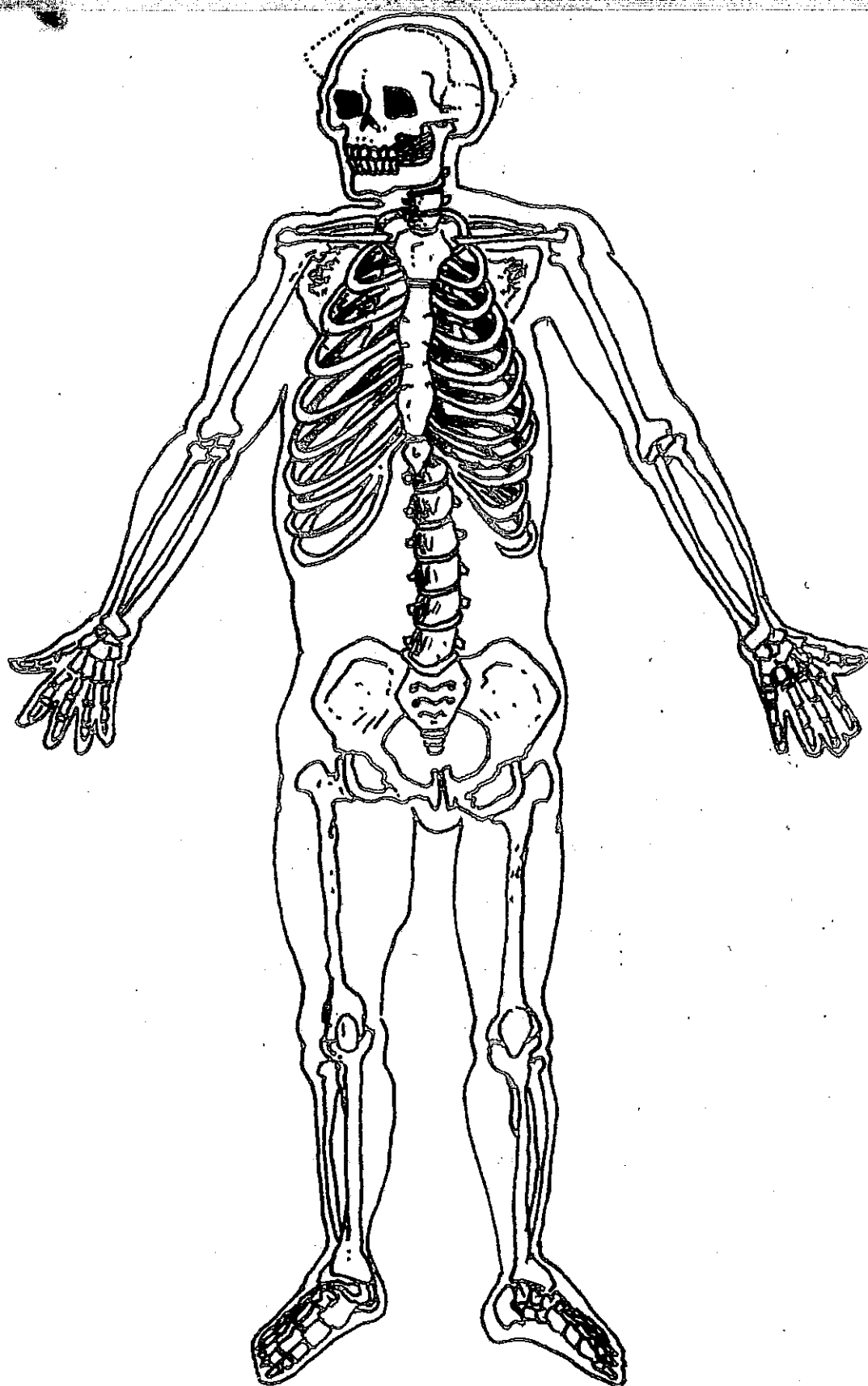


Figure 28A. Male skeleton.

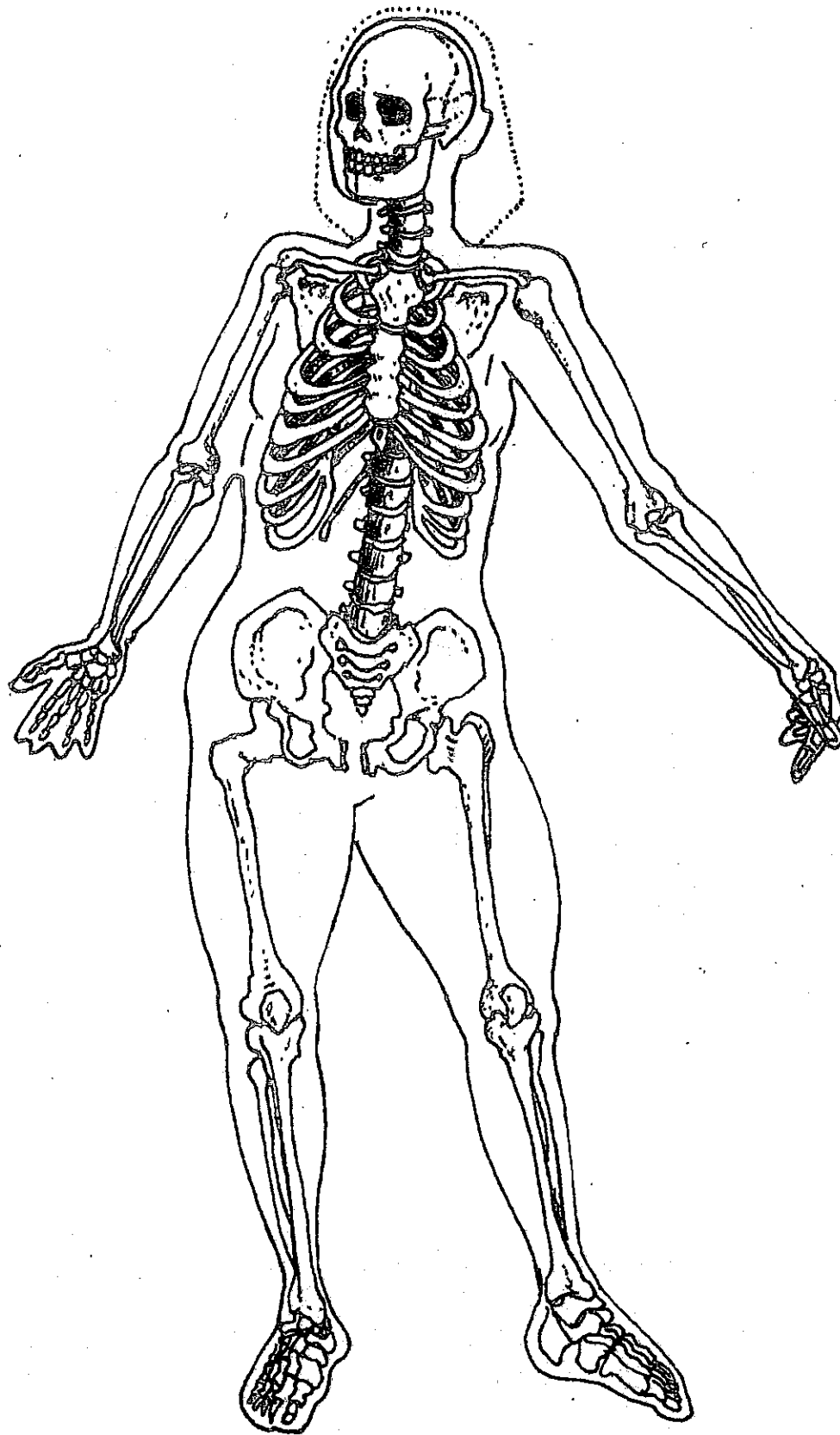


Figure 28B. Female skeleton.

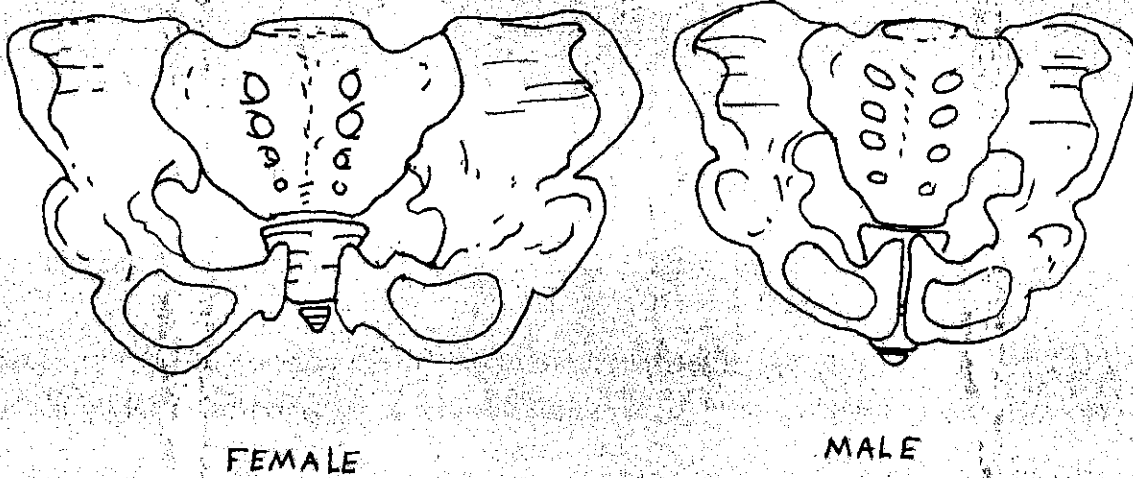


Figure 29. The pelvic girdle of a female is wider than that of a male. The female pubic arch is wider, and the bones are lighter and smoother.

Male or Female?

When examining a skeleton, forensic archaeologists can determine its sex by examining the pelvic girdle and several other factors:

- The female skull is rounder and smaller than the male's. The female forehead is longer vertically, and the jaw is smaller.
- The female sacrum is wider and shorter than the male's.
- In a female, the coccyx (or tail bone) is more moveable than in a male.

Figure 30 shows a sacrum and a coccyx.

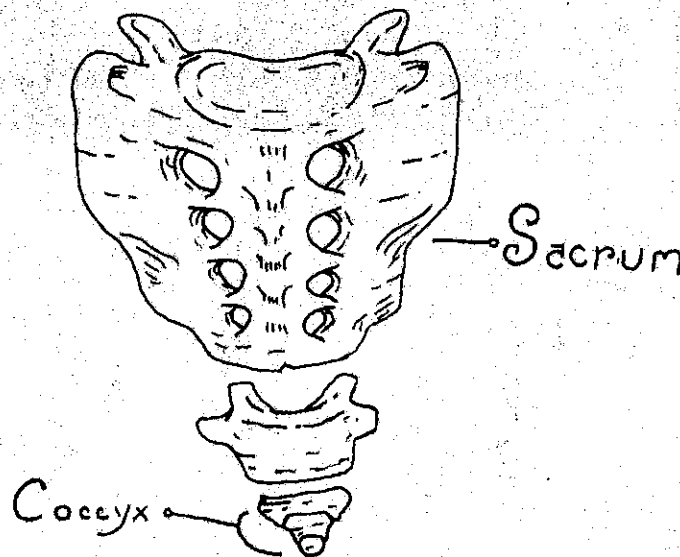


Figure 30. The sacrum and coccyx.

Skulls Grow

The skulls of adolescents and children are quite different from those of adults. At birth, the skull is incompletely developed. The bones of a child's head are not fused together as they are in adults. Instead, they are separated by membranous areas called fontanelles or soft spots. These fontanelles allow some movement between bones, so that the developing skull can be partially compressed and therefore able to change shape slightly. The compressibility of the skull enables an infant to pass through the birth canal. As a child grows, these bones slowly grow together and eventually fuse.

Bones Tell a Story

To determine if a person was right- or left-handed, an archaeologist compares the size of the bones in each arm. Bones in limbs that are used a lot are larger than bones in limbs that receive little use. Similarly, loss of use of a limb can cause the bones in that limb to be small. Injuries and disease are also reflected in bones. Breaks and fractures are generally easy to find. Degenerative bone and joint diseases, such as arthritis and osteoporosis, can be seen in skeletal remains.