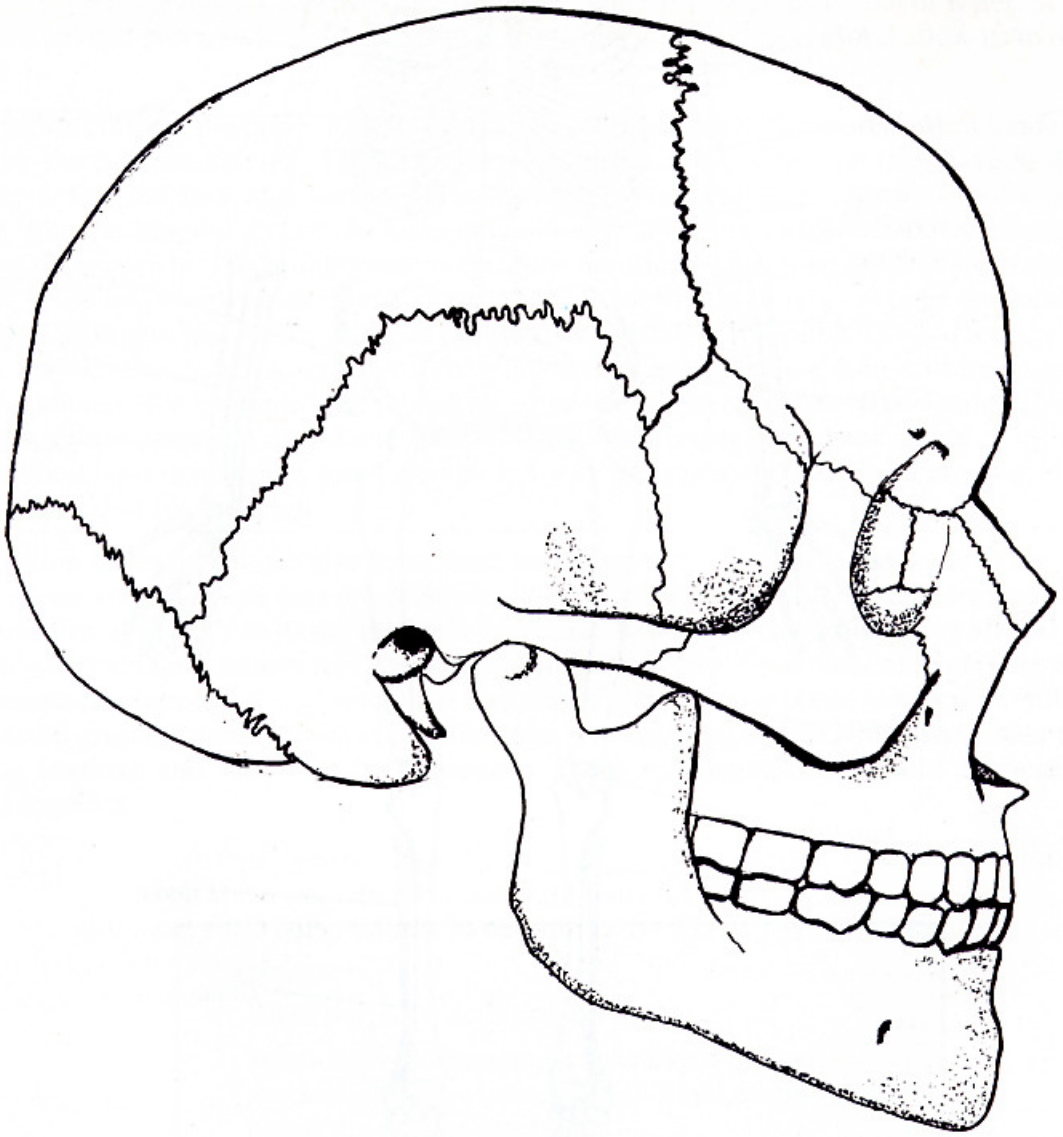
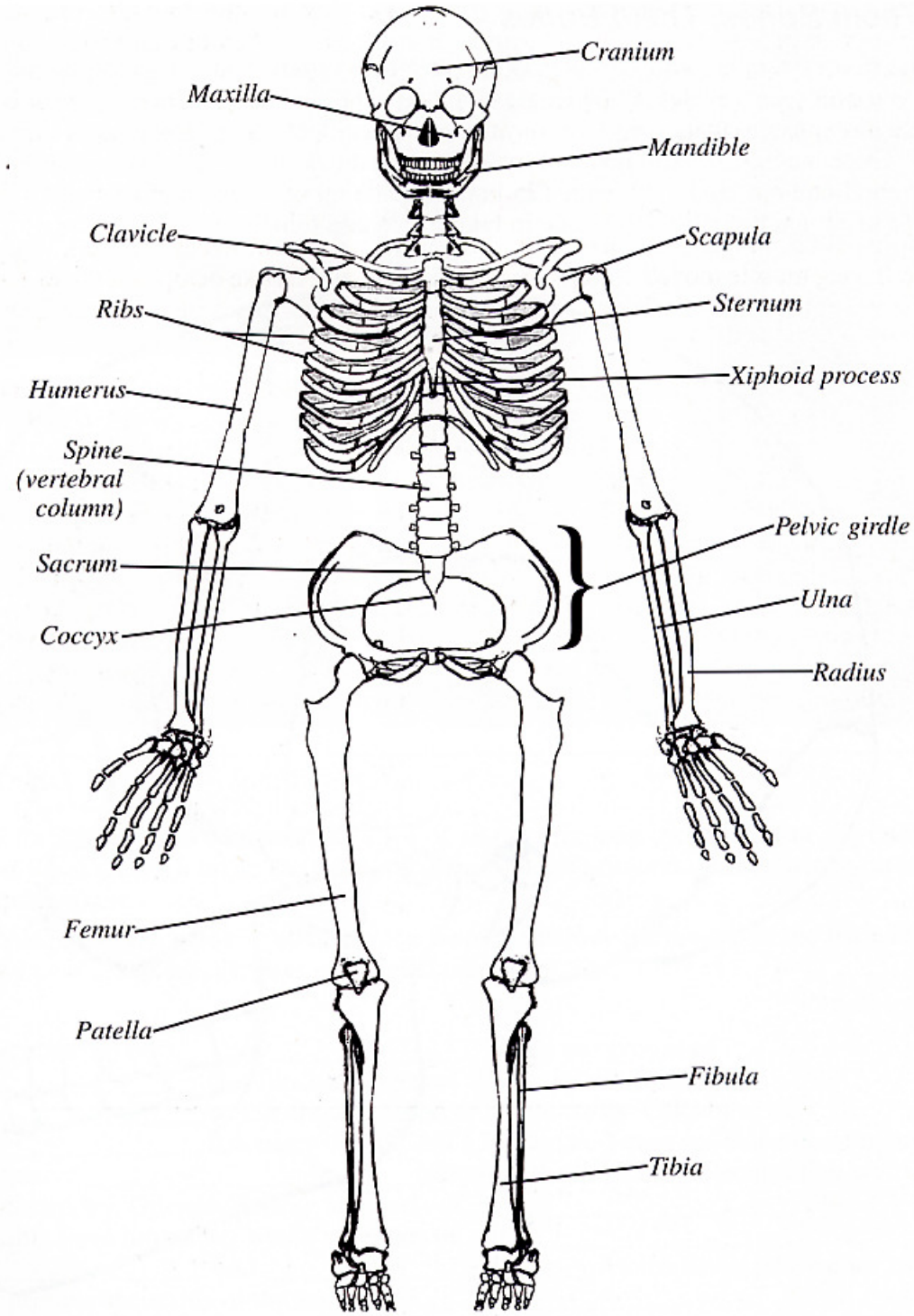
31: *Them Bones, Them Bones*

The first system we will consider is the **skeletal system**. You can probably guess what this is. Have you ever seen a skeleton? Of what is it made? The skeletal system is made of **bones**. Except in unusual circumstances, as when a deformity or an accident causes a change, every human has 206 bones. These include 28 skull bones, 1 hyoid bone in the neck, 26 back bones that make up the **spine** or vertebral column, and a **rib cage** (25 bones) made up of 12 pairs of ribs and a sternum (breast-bone). The number of ribs is the same in both males and females.



Notice how the skull is made of many bones that fuse together into non-moveable joints. This is critical for protecting its delicate contents.



The skeleton is the frame of the body. The bones making up the skeleton provide support and protection. Joints between the bones provide the mechanical basis for motion.

Sixty-four bones make up the **upper appendages**. The **shoulder girdle** consists of collar bones and shoulder blades which suspend the arms. The arms are called **upper extremities**; these include the upper arms, lower arms, wrists, hands and digits (fingers). There are 62 bones making up the **lower appendages**. The **pelvic girdle** is composed of pelvic bones that suspend the legs. The legs are **lower extremities**, which include the upper legs, lower legs, ankles, feet and digits (toes).

What would a person be like without bones? Bones are to humans what a frame is to a house. Without them we would just be blobs of muscle, fat and organs. We would have no particular shape, and we would not be able to direct our movements. If an arm muscle moved, the blob would just slither. If a leg muscle moved…more slithering. We would be like octopuses out of water. So you see, bones are a critical part of what makes us as we are. They give us structure and allow us to direct our motions.

The **joints** connect the bones and allow them to work together. There are several kinds of joints making up the human skeleton. They are designed specifically for the job they have to do. Some move freely, like the **ball and socket** joints in the hips and shoulders. Others move in only one direction, like the **hinge** joints of the knees and elbows. There are **saddle** joints where our thumbs connect with our wrists. These important joints allow our thumbs the great range of movement that is important in the ways we use our hands. There are **pivot** joints that allow us to twist our forearms and lower legs. **Gliding** joints, such as those in our wrists and ankles, give our hands and feet the freedom to rotate. On the other hand (so to speak), there are several joints that are quite stiff by design. Some bones (backbones, for example) are joined together with stretchy **connective tissue**. These joints stretch just a little, allowing us to bend over while still protecting the organs inside of us. After we reach adulthood our skull bones join together in a way that prevents them from any movement and provides protection for the brain.

In addition to the bones, we also have some **cartilage** that helps to fill out some of our features. The tips of our noses and our ears are examples of body parts containing mostly cartilage. Cartilage is like bone, but it doesn't have the minerals that make bone hard. So cartilage is soft and rubbery. Play with your ears for a minute and see what cartilage feels like. Okay now, stop playing with your ears! Because cartilage is soft and smooth, it also serves at the ends of bones to keep their rough, hard surfaces from grinding against each other. Cartilage is one type of connective tissue. Other types are the strong **tendons** and soft, stretchy **ligaments**. These connective tissues hold the bones of our skeletons together.