

Concept

The Human Skeleton

A storehouse of information

Since the time of the Neanderthals, humans have buried their dead. As a result, intact human skeletons (Figure 3.80) are sometimes preserved in single graves or cemeteries. Archaeologists and physical anthropologists spend hours carefully uncovering and removing these skeletal remains from the ground. Bones and teeth are taken to the laboratory, where a surprising amount of information can be obtained from the observation and measurement of various features. Consideration of a series of burials from a single cemetery can provide information about the entire population, including demographic characteristics, life expectancy, and inheritance patterns.

The human skeleton is much more than a structural framework for supporting the body. Bone tissue contains a wide variety of information about the individual to whom it belongs. The length and thickness of bone, for example, provide an indication of an individual's size and strength. Stature can be estimated from measurements of the long bones of the arm or the leg (Table 3.4). Evidence of disease or illness is also embedded in bone. It is often possible to determine age at death, the cause of death, sex, a history of disease or accident, and nutritional status from analyzing prehistoric human bone. Diet, too, may be reflected in the chemical composition of bone (see "Bone Chemistry and Prehistoric Subsistence," p. 168).

The sex of a skeleton is indicated by several features. Adult males are generally taller than females, but in most cases, size alone is not a sufficient indicator of sex. Several features of the pelvis are most important for determining the sex of skeletal remains. The female pelvis is wider than that of the male and slightly different in shape.

Several indicators are used to estimate age at death, one of the most

important being teeth. The age of children and adolescents is relatively simple to determine from teeth. In many mammals, the deciduous teeth of young individuals are replaced by permanent teeth, and the eruption patterns of permanent teeth are well established. For example, most 6-year-old humans are missing their two front teeth; we speak of a 12-year molar, referring to the age at which that tooth erupts.

The size and condition of skeletal bones can also be used to estimate age at death. Body size, as indicated by the length of long bones, is one clue. However, the joint ends of long bones, called **epiphyses** (e-PIFF-a-SEZE), provide even more reliable information. During childhood and adolescence, as the skeleton grows and hardens, the ends of long bones are separate from the shaft to facilitate growth. However, at puberty and during adolescence, the epiphyses harden and unite with the shaft to become a single bone, terminating growth. The age of epiphysis union varies for different bones, and that information can be used to determine the age at death. By the early twenties, the development of teeth and bones is largely complete in humans. Less precise indicators must be used to estimate the age at death from the skeletal material of older individuals. Skeletal features used to determine the age of older adults include the pelvis and the skull, and degenerative changes in bone tissue.

Stress during one's lifetime is also revealed in the skeleton. Malnourishment in childhood causes the disruption of bone growth, which shows up in the skeleton as a series of distinct features, known as *Harris lines*, in the ends of long bones. Tooth enamel also reflects childhood stress and malnourishment in an irregular series of lines, a condition known as *dental enamel*

TABLE 3.4 Estimating Stature from Femur Length

Femur Length, mm	Stature	
	cm	in
452	169	66
456	170	66
460	171	67
464	172	67
468	173	68

Source: Adapted from R. Jurmain, H. Nelson, and W. A. Turnbaugh. 1987. Understanding physical anthropology and archaeology, 4th ed. St. Paul, MN: West.

epiphysis The end of a long bone in humans and other mammals that hardens and attaches to the shaft of the bone with age.

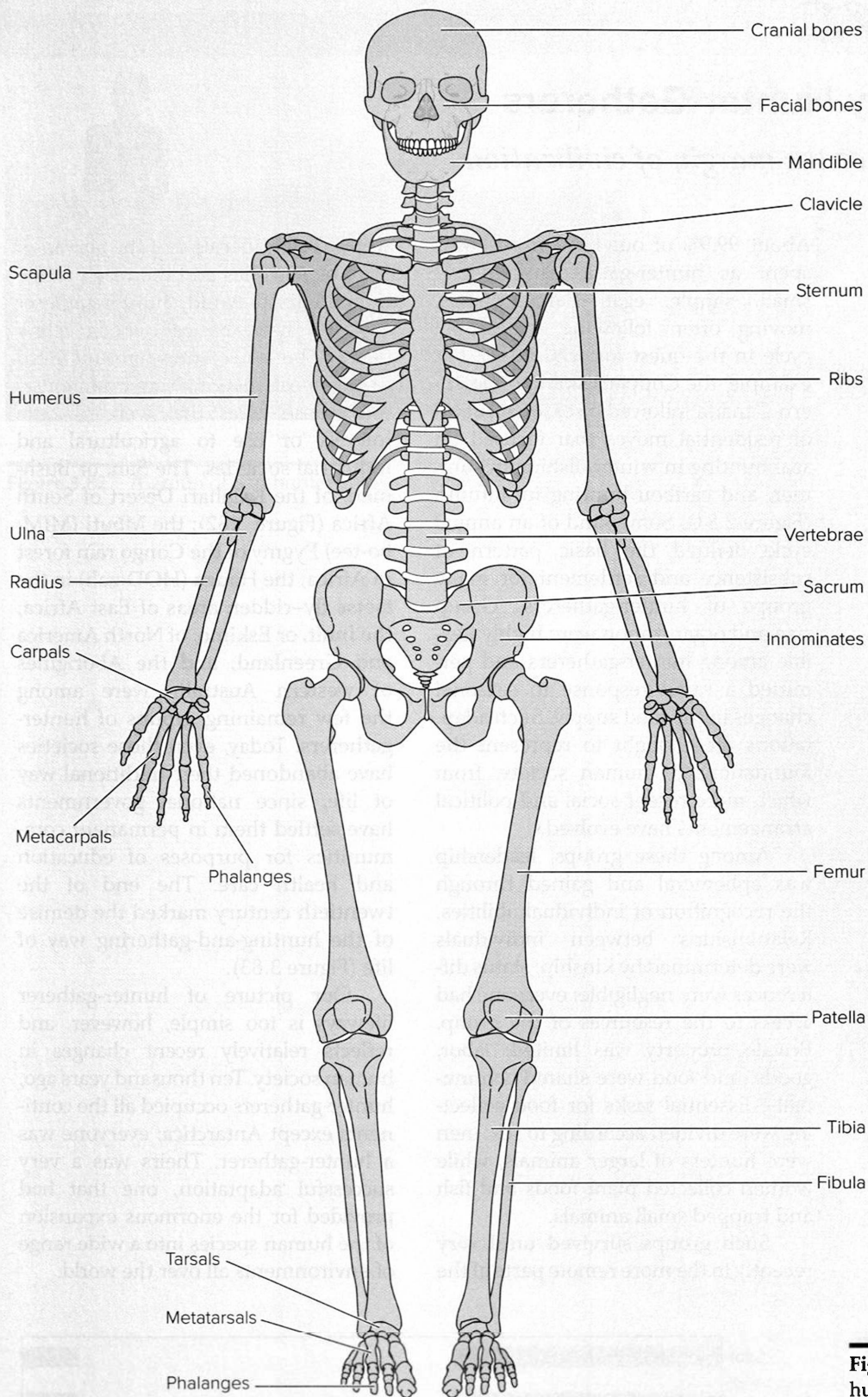


Figure 3.80 The major bones of the human skeleton.

hypoplasia (HI-po-PLAY-sha). Various diseases and other health problems also are reflected in bone. Arthritis is one of the most common conditions in the bones of older adults, characterized by

an accumulation of bone tissue around the joints. Syphilis, tuberculosis, and other infectious diseases may result in bone loss and pitting or deformation of the skull and other bone surfaces.