FIGURE 2.1

Standard anatomical posture with major movements shown. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

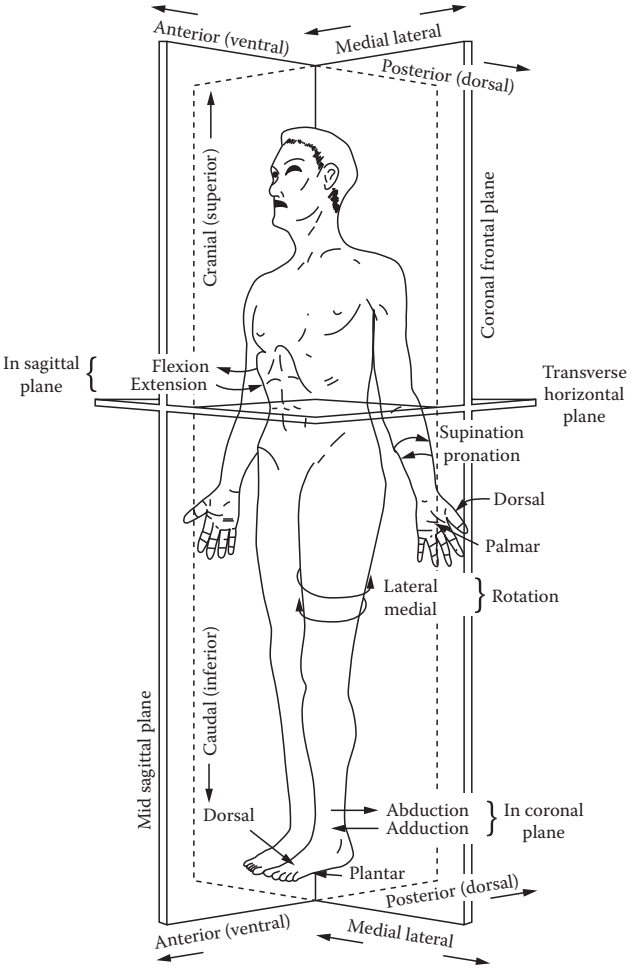

FIGURE 2.2

Major bones of the human skeleton. (a) Anterior and (b) posterior.

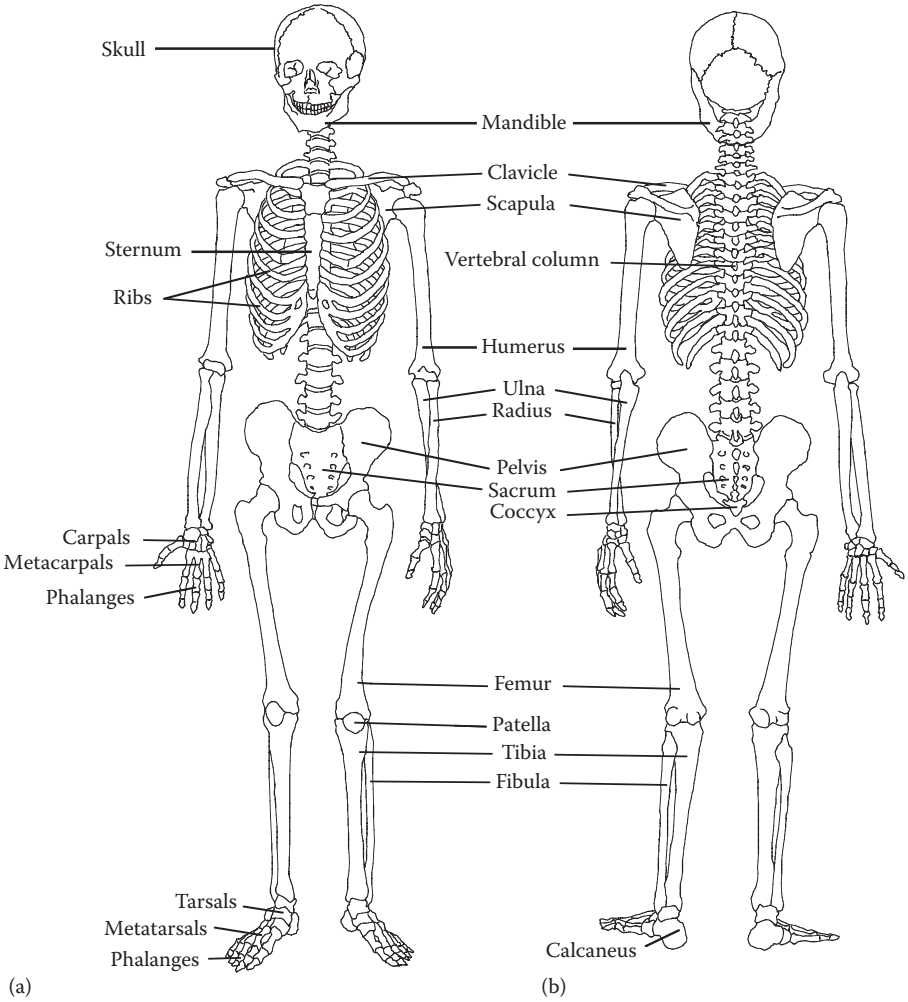

FIGURE 2.3

Diagram of a long bone, shown in longitudinal cross. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

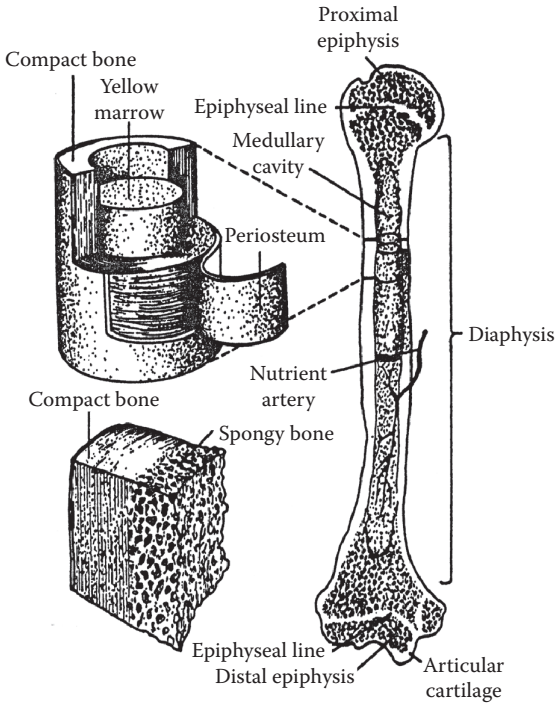

FIGURE 2.4

Diagram of the Haversian system within compact bone. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

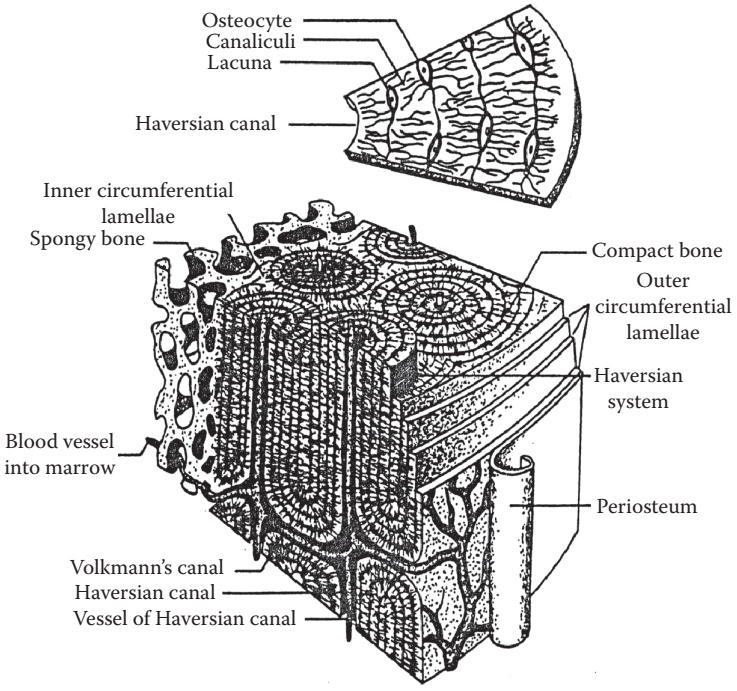

FIGURE 2.5

A typical stress–strain curve for a material in tension.

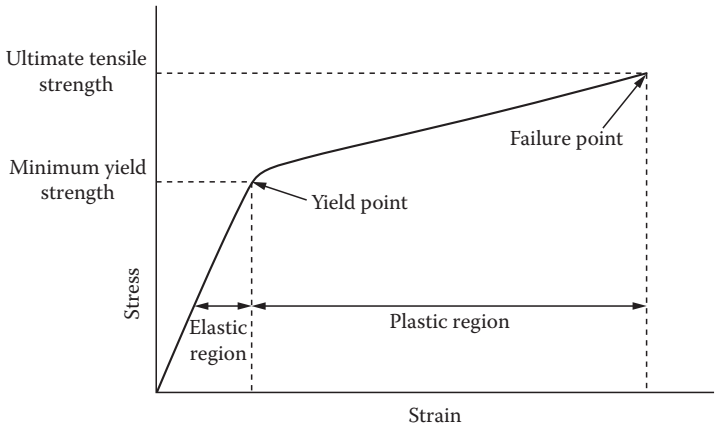

FIGURE 2.6

Stress–strain curves for bone and other materials in tension. Bone—compact bone from human femur. (Modified from Reilly, D.T. and Burstein, A.H., *J. Biomech*., 8, 393, 1975.) Copper—99.9% pure copper. (Modified from Weast, R.C., *Handbook of Chemistry and Physics*, The Chemical Rubber Co., Cleveland, OH, 1969.) Glass—6 mm strand, SiO_2 with 20% Na_2O. (Modified from Weast, R.C., *Handbook of Chemistry and Physics*, The Chemical Rubber Co., Cleveland, OH, 1969.) Titanium—6Al-4V alloy. (Modified from Weast, R.C., *Handbook of Chemistry and Physics*, The Chemical Rubber Co., Cleveland, OH, 1969.)

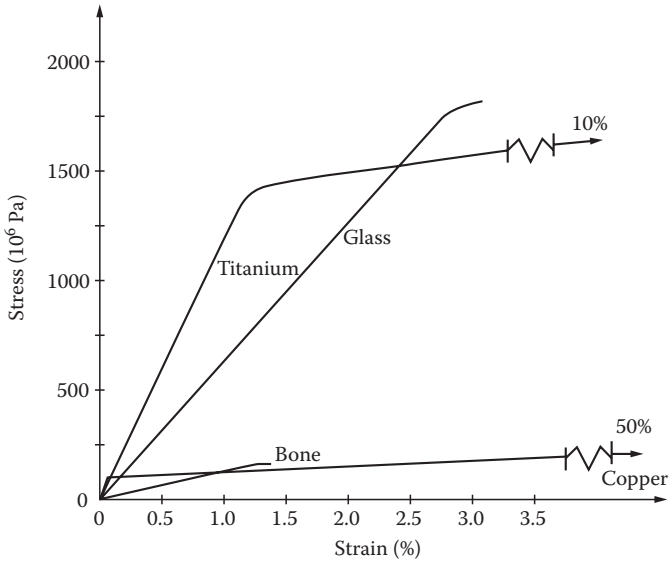

FIGURE 2.7

Schematic representation of various loading modes.

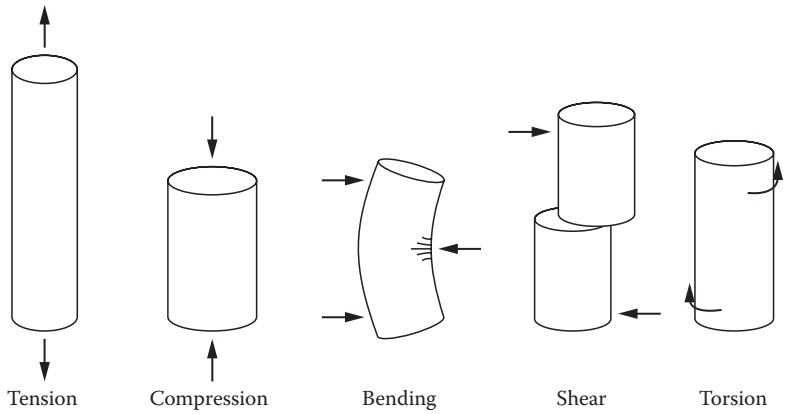

FIGURE 2.8

Ultimate strength at failure for human cortical bone specimens test in compression, tension, and shear. Shaded area indicates stresses experienced during running (Carter, D.R., *J. Biomech*., 11, 199, 1978). (Adapted from Frankel, V.H. and Nordin, M., *Basic Biomechanics of the Skeletal System*, Lea & Febiger, Philadelphia, PA, 1980.)

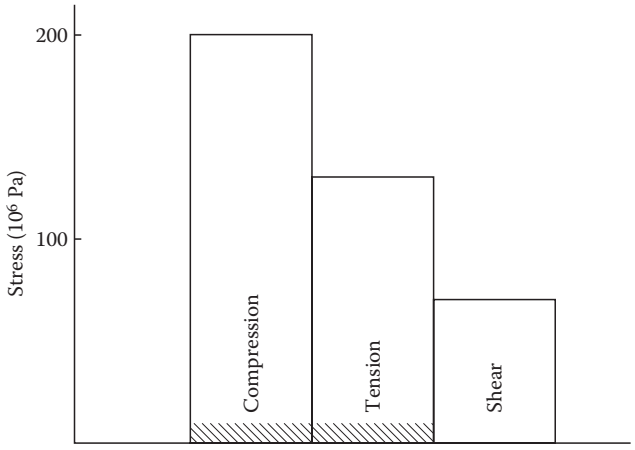

FIGURE 2.9

Stress–strain curves for cortical bone tested in tension in four different orientations. (Adapted from Reilly, D.T. and Burstein, A.H., *J. Biomech*, 8, 393, 1975.)

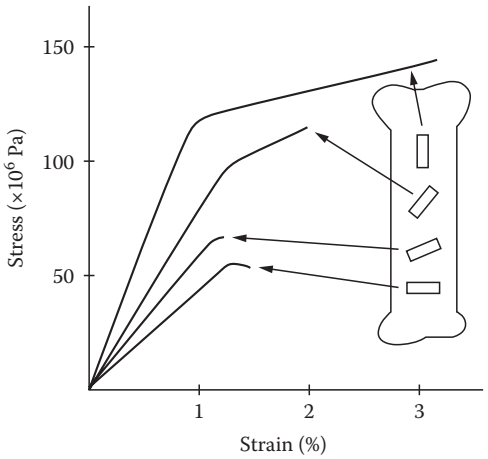

FIGURE 2.10

Stress–strain curve for collagen fibers in tension. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

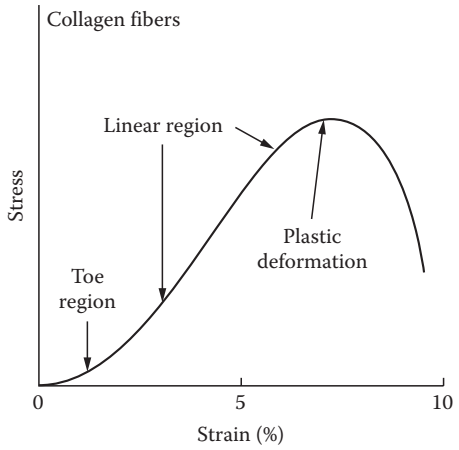

FIGURE 2.11

Stress–strain curve for elastin fibers in tension. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

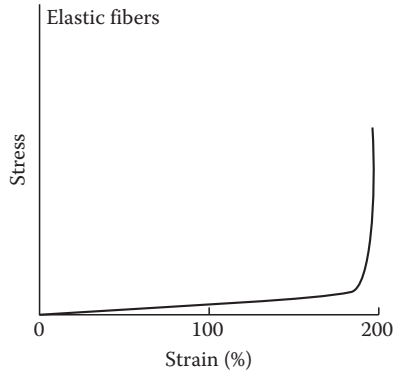

FIGURE 2.12

Schematic diagram of the structural orientation of tendon, ligament, and skin fibers. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

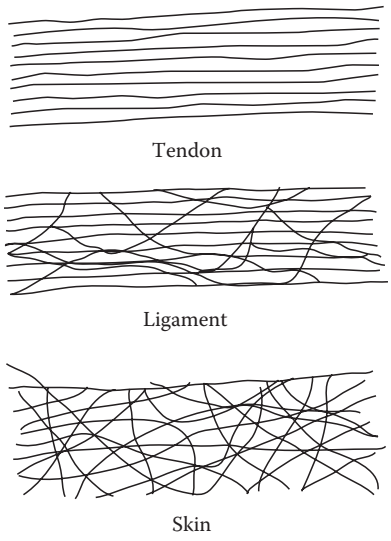

FIGURE 2.13

The hierarchical structure of tendon. (Adapted from Gupta, H.S. et al., *J. Struct. Biol*., 169, 183, 2010. With permission.)

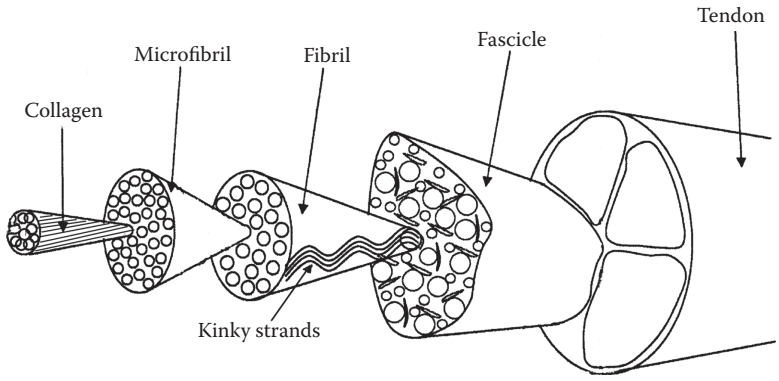

FIGURE 2.14

Stress–strain curve for three types of human tendons from cadavers. (From Harris, E.H. et al., *Med. Biol. Eng.*, 4, 253, 1966. With permission.)

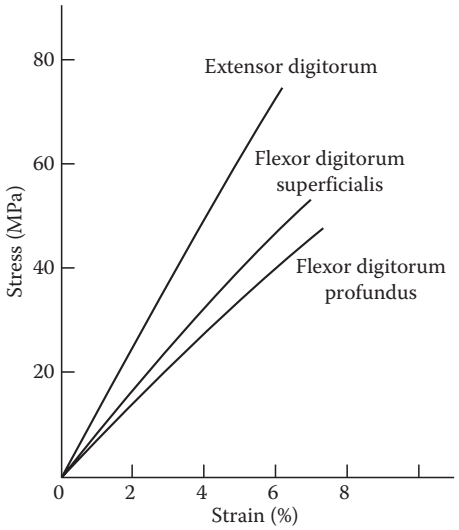

FIGURE 2.15

Schematic diagram of articular cartilage surface with a monolayer of lubricating proteoglycan. (Reproduced from Mow, V.C. and Ratcliffe, A. In: V.C. Mow and W.C. Hayes (eds.), *Basic Orthopaedic Biomechanics*, 2nd edn., Lippincott-Raven, Philadelphia, PA, 1997. With permission.)

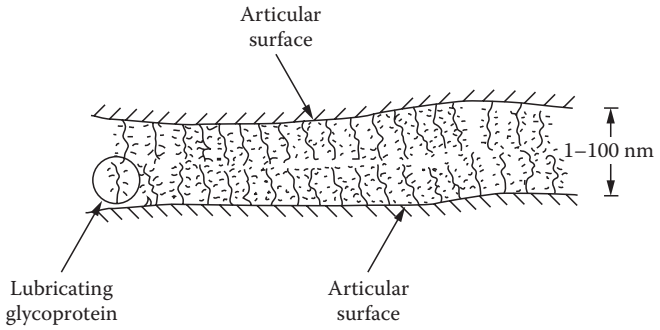

FIGURE 2.16

Stress–strain curve for articular cartilage. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)

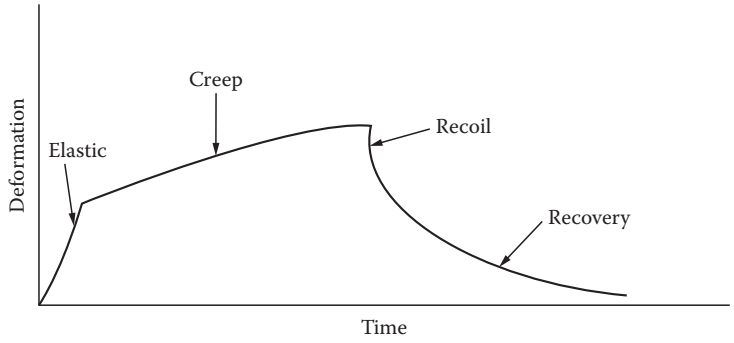

FIGURE 2.17

Diagrams illustrating three modes of joint lubrication: (a) hydrostatic; (b) hydrodynamic; (c) squeeze-film. (Adapted from Frankel, V.H. and Nordin, M., *Basic Biomechanics of the Skeletal System*, Lea & Febiger, Philadelphia, PA, 1980.)

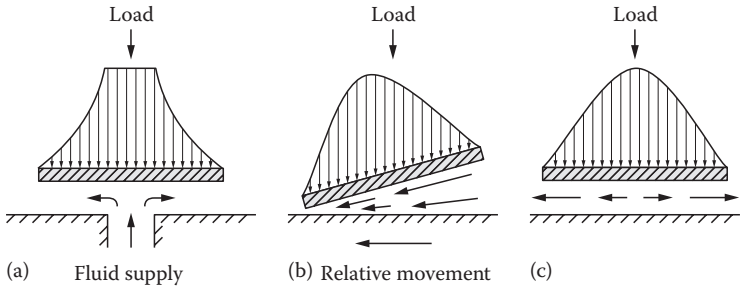

FIGURE 2.18

Structure of intervertebral disc: A, annulus fibrosus; N, nucleus pulposus. (Reproduced from Chaffin, D.B. et al., *Occupational Biomechanics*, 3rd edn., John Wiley & Sons, New York, 1999. With permission.)