CORONARY ARTERIES

The coronary arteries form an upside-down crown (L. corona) on the surface of the heart. The arteries lie in grooves, or sulci, often covered over by the epicardium.

Both **left** and **right coronary arteries** arise from small openings (*aortic sinuses*) just above the two aortic semilunar valve cusps. Generally, the left coronary artery is somewhat larger than the right. During the cardiac cycle, the flow rate through the left is greater in most people than that through the right. There may be considerable variation in the anastomotic pattern of the left and right arterial branches. These branches terminate in multitudes of arterioles supplying the vast capillary network among the muscle fibers. The apparent multiple communications among the left and right coronary arteries notwithstanding, varying degrees of vascular insufficiency occur when there is significant obstruction of one or both coronary arteries. There is some extra-coronary arterial supply to the heart from epicardial vessels (branches of internal thoracic arteries) and aortic vasa vasorum.

Damage to the intimal layer of coronary arteries can occur with lipid deposition or inflammation. Platelet aggregation at these sites contributes to the formation of **plaque** (cell material, lipid, platelet, fibrin). Plaque builds up within the vessels, forming thrombi that occlude the vessels in progressively greater degrees. Significantly reduced blood flow to the myocardium (*ischemia*) can cause sharp pain (angina) to the chest, back, shoulder, and arm as well as permanent damage to the **myocardium** (**infarction**), not to mention disability and death.

CARDIAC VEINS

The **cardiac veins** travel with the coronary arteries, but incompletely. Vast anastomoses of veins occur throughout the myocardium; most drain into the right atrium by way of the **coronary sinus**. The **anterior cardiac veins** conduct blood directly into the right atrium. Other small veins may drain directly into the right atrium as well. Some deep (arteriosinusoidal) veins drain directly into the atria and ventricles. Extracardiac venous drainage can also occur through the vasa vasorum of the vena cavae.