

LABORATORY EXERCISE 19: Circulatory System

For this exercise, use an adult cockroach, *Blaberus* spp., *Gromphadorhina portentosa*, *Periplaneta americana*, or *Nauphaeta* sp., recently drowned in physiological saline or invertebrate Ringers solution. Pin the insect, ventral side up, in a dissecting dish, and cut away the sternal region of the abdomen and thorax in exactly the same manner as you performed the respiratory system dissection in the last laboratory exercise. Carefully pin all of the interfering internal organs out of the way, off to the side of the roach, but do not disconnect these tissues at this time.

The **heart**, **aorta**, and associated **alary** (aliform) **muscles** should be clearly visible attached to the dorsal diaphragm (dorsal septum) of the insect's body, nearly pressed against the inner surface of the dorsal integument (tergum). Keep the internal organs and heart bathed in saline solution. It is possible you will see peristaltic contractions of the heart, traveling rapidly from back to front. If so, can you determine whether or not the aliform muscles are contracting? If they are, do they beat at the same rate and in the same sequence as the circular muscles of the heart? Try to locate a pair of **ostia**; you may see particulate matter in the saline solution being sucked in through these incurrent valves if the heart retains some activity.

If your specimen is of the genus *Blaberus*, you should be able to easily locate lateral segmental vessels in the posterior half of the abdomen, along with a few pairs in the thoracic region. Look for any contractile activity or hemolymph flow in the segmental vessels. Remember that mantises, also members of the order Dictyoptera, possess similar lateral segmental vessels, probably indicative of their close phylogenetic relationship to cockroaches.

When you have completed your observations of the living circulatory system, you can stop the heart with a dose of ethyl alcohol. Make a schematic drawing of the circulatory system *in situ*, placed within an outline sketch of the insect's body, in the manner of drawing #34 of the respiratory system (this latest is **Drawing #36**). Label the parts as above, and number the segments of the body (see fig. 17.1 in Gillott).