

LABORATORY EXERCISE 21: The Nervous System

A preserved specimen of any large cockroach may be used here (although freshly killed ones might be better). Pin the insect dorsal side up in the dissecting dish, and laterally cut away most of the abdominal tergite area to facilitate dissection. Carefully remove the digestive tract, tracheae, etc., from the abdominal cavity, until you expose the **ventral nerve cords** and their **ganglia**. Continue this dissection into the thorax; note that part of the endoskeleton of the meso- and metathorax projects between the paired nerve tracts at several places in the thorax.

To expose the **brain**, insert the scissors or scalpel in the mouth and make a median cut through the clypeus, frons and vertex, to the occipital foramen (the large hole in the back of the head leading into the thorax); then break away, using great care, the hardened areas of the cranium surrounding this cut. This can probably best be accomplished by chipping away at the sclerotized material of the head capsule with a pair of forceps, although some of you may find that it goes more easily with a scalpel or razor blade. Remove, bit by bit, any muscle that is present within the head; this should expose the brain and its lateral and ventral and posterior connectives. Note that the ventral nerve cord enters the head between the tentorial bridge (corpora tentorium) and the ventral arch of the foramen. Ventrally in the head, locate the subesophageal ganglion and its circumesophageal connectives with the brain.

When your dissection has been completed, remove the nerve cord and head ganglia and pin them in position in your dish, containing alcohol. Make a drawing (**Drawing #40**) of the central nervous system, labeling protocerebrum, deutocerebrum, tritocerebrum, ocular and ocellar nerves, optic lobes, subesophageal ganglion, circumesophageal connectives, and thoracic and abdominal ganglia. Refer to Imms figure 18; Romoser figures 4-3, 4-4, and 4-5; or Gillott, figure 13.4.

There are a couple of slides on demonstration of mounted and stained central nervous systems of insects with which you may compare your own dissection.