LABORATORY EXERCISE 5:
Integument, Part Two.

Histology of the Integument

Using the compound microscope, carefully examine a slide showing the body of a cockroach in longitudinal (lengthwise) section. Note: THESE ARE VALUABLE SLIDES THAT CANNOT BE REPLACED, so be forewarned and take it easy. Under LOW power, find a section of the cuticle that is thick and well sclerotized and that seems to show the layering of the integument clearly; preferably, the view should include a seta in longitudinal section, although this may be difficult or impossible to achieve in some slides. Then switch very carefully to high power and draw the section (**Drawing #6**), labeling the epicuticle, exocuticle, endocuticle and epidermis. If you can see them, note and label the trichogen, tormogen, and nerve cells associated with the seta (see Romoser, fig. 2-9 and Gillott, fig. 11.1 and 12.1).

Outgrowths of the Integument

(a) **Microtrichia**. See the demonstration of the house fly integument (on the fly's proboscis) and examine an ant or fly wing. On the fly proboscis, the microtrichia are minute hairs clothing the integument between much larger setae; on the wings, microtrichia are found everywhere while larger setae line the margins of the wings and occur on some of the main veins.

(b) **Spines**. Cellular, immoveable processes. Exemplified by the thorn-like projections on the legs of many beetles (Coleoptera). Beetle **horns** are another example of structures similar to spines.

(c) **Setae** (macrotrichia). Examine under the dissecting scope the hair covering on the bodies of several insects (Diptera, Hymenoptera, etc.). Setae may also be seen on the proboscis of the house fly and on the wings of most Diptera (flies) and Hymenoptera (bees, wasps, ants), as discussed above.

(d) **Scales**. Highly modified setae. Best represented on the wings of Lepidoptera (butterflies and moths). Several slides are available for examination under the high power of the compound microscope.

(e) **Glandular Setae**. Exemplified by the urticating (irritant) hairs of certain caterpillars. See demonstration.

(f) **Spurs**. Multicellular like spines, but moveable. These are well developed on the legs of various cockroaches, like *Blaberus* spp. and *Periplaneta americana* (the American cockroach), as well as on the legs of grasshoppers (Orthoptera). Draw (**Drawing #7**) one of these spurs as seen under the high power magnification of the dissecting scope, showing the basal attachment (membranous socket and point or points of articulation to the surrounding sclerotized cuticle). Specimens of roaches and grasshoppers preserved in alcohol are available for this study.

(g) **Sculpturing** and **Coloring** of the Integument. Pinned specimens showing several types of cuticular sculpturing and metallic coloring will be on demonstration. Numerous examples of pigment coloring are also available for examination. Note iridescence (physical colors) in several butterflies, wasps, beetles and flies.