

idae, the average relative length of the esophagus is long (0.203 and 0.213, respectively), but in the Proteidae, Sirenidae, and Amphiumidae it is short (0.102, 0.133, and 0.128, respectively; see table II).

The Plethodontidae, the only family which supplied more than one genus for the present study, shows a basic similarity among ~~the~~ four genera, even though each genus possesses distinctive features of its own. The basic similarity among these four genera is shown in the absence of a pyloric constriction, and in the following features of the liver: The lack of extensive lobing; the presence of a small left posterior lobe; the presence of a single, prominent midventral hepatic vein; the location of the postcaval vein in an open groove along the right, dorsal side of the liver; and the position of the gall bladder on the right side of the posterior border of the liver. Figures 8-11 and 12 (I-Q) illustrate a number of these characteristics.

The features which may be used in distinguishing between the genera of the Plethodontidae are: The proportion and general shape of the liver (Figure 12, I-Q); the presence or absence of a left anterior lobe of the liver; the presence or absence of a deep fissure in the left margin of the liver; and the amount of pigmentation of the mesentery and of the peritoneum of the dorsal body wall (Table V). However, no one of these features may be relied on alone, because of the variations noted in Table III above.

In every genus in which more than one species was studied, all the species have some distinctive features of the digestive system in common. Such features in the genus *Ambystoma*, for example, are: The absence of a definite point of external demarcation between esophagus and stomach; a relatively long esophagus; the relatively broad proportion of the liver; the absence of a left anterior lobe; the presence of a definite postcaval lobe; the embedded state of the hepatic veins and the postcaval vein in the liver substance; the relatively short length of the liver; and the relative abundance of pigment cells of the peritoneum.

With regard to the digestive system, the most diagnostic feature appears to be the form of the liver, as its shape and lobing are distinctive for all the genera included in the study. Unless further studies should find overlapping, this may prove to be of some value in the classification of the caudates. However, no distinctive feature of the digestive system was found which would permit the separation of species within a genus.

Because of the distinctive characteristics of the digestive system noted among the various groups studied, it may be concluded that the comparative gross anatomy of the digestive system tends to confirm the taxonomic categories which are already accepted for these salamanders. Investigations on liver morphology should

FIGURE 12 (opposite page). COMPARISON OF LIVER OUTLINE FORMS. A: *Cryptobranchus a. alleganiensis* (ventral view, convex surface). B and C: *Necturus maculosus* (two extremes; ventral view, convex surface). D: *Siren lacertina* (convex surface). E: *Amphiuma tridactylum* (convex surface). F: *Ambystoma maculatum* (ventral view, convex surface). G and H: *Notophthalmus v. viridescens* (two extremes; ventral view, convex surface). I and J: *Desmognathus f. fuscus* (two extremes; ventral view, convex surface). K: *Desmognathus quadramaculatus* (ventral view, convex surface). L: *Plethodon g. glutinosus* (ventral view, convex surface). M and N: *Plethodon c. cinereus* (two extremes; ventral view, convex surface). O: *Gyrinophilus p. porphyriticus* (ventral view, convex surface). P: *Eurycea l. longicauda* (ventral view, convex surface). Q: *Eurycea bislineata rivicola* (ventral view, convex surface). The outline form of *Ambystoma jeffersonianum* and *A. opacum* is identical with that of *A. maculatum*. The outline form of *Desmognathus o. ochrophaeus* and *D. o. carolinensis* is identical with that of *D. f. fuscus*. The outline form of *Plethodon r. richmondi* is identical with that of *P. c. cinereus*.