

developmental changes throughout larval life, they are closely similar to the imaginal leg discs.

Among other external structures studied in *burchelli* larvae was a holopneustic type of respiratory system which has some of its simple, anastomosing tracheae externally visible through the cuticle. Also in larvae of all sizes, ten pairs of spiracles are present as small, sclerotized, cuticular openings on the dorsolateral surface of the third through twelfth larval segments.

The anal opening is present in all larvae as a transverse slit on the ventral surface of the 14th. segment.

INTERNAL MORPHOLOGY

General inspection of the polymorphic larval range.—Results from microscopic observations of the internal morphology of larvae through the polymorphic range of any one day's sample do not indicate a linear progression synchronized either in the time of initiation of organ development or in the rate of onset of organ function. With respect to their internal structures, the largest larvae in each day's sample were more advanced in development than were the intermediate (size-graded) or smallest larvae of that sample. In all larvae, the size of the internal organs varies directly with body length, and consequently, a smooth series in the sizes of organs is found between the extremes in body length.

Consideration of all samples throughout development indicates that the onset of activity of the various organs and organ systems is observed first in the largest larvae of each day's sample. However, neither the characteristics of any one internal structure nor of any one tissue could be used to distinguish the various polymorphic forms *per se*.

A. Alimentary canal.—The alimentary canal of *burchelli* larvae is essentially a straight tube divided into the foregut, midgut and hindgut (figs. 6, 7, 8, 9, 10, 11 and 12). The foregut extends from its anterior limit at the mouth opening to the region of the metathoracic segment. It proceeds posteriorly as a narrow tube and then reflects upon itself in the prothoracic segment to form the esophageal invagination or cardiac valve. This valve projects into the lumen of the midgut. The foregut is composed of the buccal cavity, the pharynx, the esophagus and the reflected portion of the esophagus, the cardiac valve. The cardiac valve terminates the foregut in the metathoracic segment (fig. 8).

The midgut extends from the mesothoracic segment to the eleventh segment as a large, dilated, blind sac. The midgut is the largest organ of the larva and appears to serve as a mould around which the other abdominal organs are oriented (fig. 6).

The hindgut extends from the blind, posterior limit of the midgut to the ventral surface of the fourteenth segment where it opens to the exterior