polymorphic range. A graphic expression of the results indicates that the allometrically expressed growth rate is characteristically different for individuals through the polymorphic series, being slowest in the largest, somewhat greater in the intermediate and most rapid in the smallest larvae. These results might have been expected from SCHNEIRLA's (1933) confirmation and extension of MÜLLER's (1886) single observation that in *E. burchelli* the worker majors are the first individuals in each brood to eclose, the workers minima last. SCHNEIRLA (1949) has also reported that in *E. burchelli* and *E. hamatum* similar conditions prevail as to the attainment of larval maturity and enclosure in the respective polymorphic types.

The type of continuous, evenly graduated polymorphism found in the all-worker broods of these Ecitons may be understood in the light of previous studies of polymorphism of the intra- or inter-caste type which it resembles. The characteristic unique to the Ecitons, as SCHNEIRLA (1938 and 1949) has emphasized, is the occurrence of such polymorphism through very large, distinctive brood populations produced at regular and well-marked intervals throughout the year.

Differing theories have been proposed regarding the cause and time at which caste determination occurs during development of the social insects and reviews of the literature on this topic (LIGHT, 1942 *a*, 1942 *b*; W. M. WHEELER, 1908, 1910, 1933; and WILSON, 1953 *a*, 1953 *b*) draw attention to two main approaches to the solution of this problem. Caste determination may be considered to be mainly or entirely blastogenic, being established by genic factors and by the amount and quality of nutritive material in the egg and embryo (W. M. WHEELER, 1933; FLANDERS, 1946 and 1952), or it may be considered to be trophogenic and due to the quality or quantity of the diet during larval development, trophic exchanges between the adults and the developing broods being the determining factors (W. M. WHEELER, 1910 and 1933, and WILSON, 1953 *a*). A blastogenic determination, on the other hand, might be regarded as restricted to genic factors alone. More recently there has been a tendency to consider both the trophogenic and blastogenic factors as contributors to the caste determination of ants (FLANDERS, 1945). In any event, it is generally accepted that caste determination begins to be established prior to the histolytic and histogenetic processes of the pupal period of metamorphosis.

Recent experimental advances bearing upon caste determination and

FIG. 8-13. — *Fig. 8.* Longitudinal section through head and thorax of brood specimen. L--larva, 8th N. D. Harris' haemotoxylin, eosin. X 55. *Fig. 9.* Longitudinal section through posterior abdomen. I--larva, 5th N. D. Harris' haemotoxylin, eosin. X 55. *Fig. 10.* Transverse section through head. S. larva, 7th N. D. Harris' haemotoxylin, eosin. X 265. *Fig. 11.* Transverse section through abdomen. I--larva, 8th N. D. Iron alum haemotoxylin. X 55. *Fig. 12.* Longitudinal section through head. L--larva, 8th N. D. Harris' haemotoxylin, eosin. X 265. *Fig. 13.* Longitudinal section through abdomen. I--larva (Near small), 5th N. D. Harris' haemotoxylin, eosin. X 265.