

and other army ant larvae. These structures are subcircular, convex, slightly elevated cuticular papillae, which lie ventral to the imaginal discs. His figures 2, 3, and 5, show the close relationship between these vestiges and the imaginal leg discs, but the present paper is not concerned with the study of the leg vestiges. These structures were seen in many of the larvae but were not always discernible and consequently, not applicable for use as a distinguishing character.

The principle employed in this study for separating the larvae into stages and establishing the existence of polymorphism in these forms was based on the heterogonic growth of the imaginal leg discs. This principle is not a new one and has often been employed in such studies.

Investigators have observed that certain organs increase in relative size with the absolute size of the body that bears them, but Huxley (1932) was first to demonstrate the significant relationship between the magnitudes of the two variables by his heterogony formula,  $y = b x^k$ , later revised to  $y = b x^a$  (Huxley and Teissier, 1936). In this revised formula, as applied to the present study,  $y$  represents leg-disc dimension,  $x$  represents body length, and  $b$  and  $a$  are growth constants,  $a$  representing the equilibrium constant and  $b$  the value of  $y$  when  $x = 1$ , i.e., the initial growth index. Huxley was first to show that problems in polymorphism in ants can be related to problems in allometric growth in other animals. For example, he finds that the morphological relationship of the chelae of many male and some female Decapods and other appendages of various crustacea follow the rule of constant differential growth ratios. Dudich (1923) finds that *Cyclommatus tarandus* has marked heterogenic male mandibles. Coleopterists distinguish main types based on mandible characters. Prizbram (1930) finds that the legs in Orthoptera also obey this rule. The earwig, *Forficula auricularia*, bears at the end of the abdomen a pair of cerci named "pincers" which vary with sex (Paulian, 1937). Measurements of the pincers show that two polymorphic types are present in the male.

In neuter social insects that show polymorphism, Huxley states that such series are characterized by relative increase of head, and especially mandible size, with an absolute increase in total size. He believes workers and soldiers represent a series of