

functional labial glands. SCHNEIRLA's (1949, 1952) field investigations show that at this time the general level of raiding activity of the colony is still low although somewhat increased over preceeding days, and consequently the amount of food available in the bivouac is considerably less than in the nomadic phase. But when the smallest larvae begin to develop leg discs about the eighth nomadic day, all larvae of the developing *burchelli* brood have functional labial glands, raiding activity is high and the amount of food being brought into the colony is greater now than at any other time in the nomadic phase of activity.

It has been ascertained that during larval development in holometabolous insects, the growth rate and extent of development of the imaginal leg discs is dependent in part upon certain external factors (BODENSTEIN, 1939, 1941 and 1953). Among the most important of these factors are the relative amounts of available food, oxygen supply and the temperature of the environment. It therefore may be of some importance in considering the results of the present investigation, to review the afore-mentioned experimental evidence. It is apparent from experimental studies, that unless certain external requirements are present at a critical time (which is probably specific for each species, and perhaps for each structure), the expression of the potencies of these imaginal structures will be altered in some way (BODENSTEIN, 1939 and 1953, JU-CHI and YU-LIN, 1936; KAJI and OGAKI, 1953, and SHULL, 1937).

In view of these considerations, it is important to note that SCHNEIRLA *et al.* (1954) have found the army ant bivouac, or temporary nest of the nomadic phase, a relatively stable environment for the larval brood, leveling off environmental extremes such as lower nocturnal temperatures which might retard brood development. It also appears significant that, as these investigators report, the highest temperatures of the bivouac (ca. 29-30° C.) are maintained near its center, and more specifically, as JACKSON (1957) has subsequently found, a temperature gradient typically exists in the bivouac with its peak in the central area. Furthermore, a gradient normally exists in the distribution of larvae in the bivouac (SCHNEIRLA, 1938; SCHNEIRLA and BROWN, 1950) with the smallest larvae held centrally and the largest peripherally. In view of these facts, it is apparent that the differential microclimate typically operating for the different size-groups of the brood population is adequate to support the respectively different rates of development it was found characteristic of them. In other words, the smallest larvae, which evidently have the fastest rate of larval development, are usually located near the center of the bivouac where the highest temperatures prevail; the largest larvae, evidently with the slowest growth rate, are located marginally where the lowest bivouac temperatures prevail during the nomadic phase.

It is probable that differences in function of the labial glands depend upon their histologically different conditions in the brood population though larval development, as indicated in this study. Also, at different developmental stages other conditions governing food-intake may