

bottle where they would run about among the other workers, and again go to the chamber. Finally,  $2\frac{1}{2}$  hours after the ants had been put into the bottle, a worker picked up a larva and carried it from the bottle through the tube into the dark chamber. Three minutes later the same worker picked up a callow in the bottle and carried it by the mandibles into the chamber. This worker then ceased her activity and remained in the chamber. When there was no more activity during the next hour, the rest of the workers were placed in the dark chamber while the larvae were placed in the tube just beyond the entrance to the chamber. Within half an hour the larvae were carried into the chamber. At first, larvae were carried in sporadically and by only 2 workers, but gradually several more joined them and trips became more frequent. The chamber containing the *duloticus* and larvae was then placed in a foraging box where the ants could obtain food and water. The majority of the workers remained at all times quiescent in the nest, but during the day 4 or 5 workers could usually be seen outside the nest simultaneously. The *duloticus* drank water and sugar syrup placed in the foraging area, and fragments of *Formica* pupae presented to them were carried into the chamber where they were eaten. The foraging was done listlessly, however, and with none of the bustle and energy of *L. curvispinosus* workers. At no time was a worker observed to lead another to the syrup or to the water tube. The larvae were frequently licked by the *duloticus* workers, but did not thrive. Within  $2\frac{1}{2}$  weeks 8 had dried entirely, while the remainder were so shrunken that it was obvious that they had not been fed by the *duloticus*.

From the above experiment it seems probable that: (1) *L. duloticus* is an obligatory slavemaker, dependent on its host species, *L. curvispinosus* or *L. longispinosus*, for the rearing of its brood. This was shown by the inefficient foraging, and the comparative neglect of the larvae. (2) *Duloticus* remains so primitive that many of its ancestral formicine instincts are still present, though in attenuated form. Such instincts are those of foraging and of deporting other workers and larvae to a new nest (distinct from the deportation that occurs during a slave raid). These instincts are probably not manifest under normal conditions, but may be called into play by the removal of the slaves.

## II. SEASONAL CYCLE.

The 2 *duloticus* colonies referred to above were kept through the winter following their capture, so that it was possible to observe the complete seasonal cycle. I present this in outline form, taking