

for the cardo (fig. 19), which in *Rhagigaster* (fig. 21) and *Tachynomyia* (fig. 28) is clearly unlike that in ants.

Until the recent discovery of *Sphecomyrma*, the fossil record of the ants has extended back only to the Eocene Epoch, or about 40 to 50 million years. Wheeler (1914) reported on ants of the Baltic amber (Oligocene Epoch) and concluded that differentiation of the ant worker caste must have been completed "not later than the Cretaceous or even the Jurassic or Triassic periods." Many of the genera described from the Tertiary fossil record are still represented today among the living ants. Wilson and Taylor (1964) have described a fossil ant colony of the genus *Oecophylla* discovered in lower Miocene deposits in Kenya. This colony contained worker subcastes whose polymorphism conforms to that of living *Oecophylla*, and this fact is submitted by Wilson and Taylor as evidence of the stability of "a specific social system" through a period of 30 million years or longer. The discovery of *Sphecomyrma* in amber of the Magothy formation has pushed back the fossil record of ants, and of the aculeate hymenoptera as well, to the Upper Cretaceous — or approximately 100 million years.

Two basic interpretations of phylogeny within the Formicidae exist in the literature: one, described by Wheeler (1928), in which the Ponerinae represent a primitive stock from which the other subfamilies radiated, and the other, formulated by Brown (1954), in which the ants divided early in their evolution into 2 complexes, the Poneroid and the Myrmecoid. Wheeler's hypothesis has been most recently supported by Robertson (1968) in a study of the venom apparatus in Hymenoptera, and Brown has been supported by Eisner (1957) in an investigation of the ant proventriculus.

The Ponerinae are generally regarded as a primitive group, and this idea is central to Wheeler's (1928) hypothesis regarding the origin of other ant subfamilies. Reid (1941) has pointed out that in thoracic characters the Ponerinae display by far the greatest diversity, which probably supports the view that they are the oldest group. Brown (1954) also indicated that the Ponerinae are an extremely heterogeneous group. This fact is borne out in an examination of the mouthparts. Palpal segmentation, the shape of the labrum, stipes, mandible, and galea all vary widely. Contrary to this trend, however, is the presence in some species of each tribe examined (except the Platythyreini) of the paraglossae and/or paraglossal sensory pegs. Also present in all tribes of Ponerinae is what appears to be a galeal comb. Again, however, it is not found in all species in each of the tribes.

Reid (1941) indicated that the thorax of some species of *Ectatomma* (Ponerinae) is similar to the typical myrmicine thorax. Subsequently other workers (Brown 1954; Brown and Kempf, 1967) have indicated that the myrmicines may have arisen from the Ectatommini near *Gnamptogenys*. Brown (personal communication) has indicated that if the second gastral segment were not fused in the ectatommines, weight would be lent to this argument, but the sclerites of this segment are fused in the ectatommines as they are in the other Ponerinae. Perhaps of greater significance is the