

the nest material itself or from accumulated secretions originating in the ants. A partial answer has been supplied by Lange (98, 100). He introduced a sensitive technique: utilizing rate of food transmission as an index of the affinity of workers of *Formica polyctena* (Förster) mixed under experimental conditions. When colony fragments were separated and maintained under identical conditions and then recombined, the intergroup rate of food transmission did not differ from the intragroup rate. However, when the fragments were given different diets or placed in different nest material for awhile, the intergroup rate dropped. Withholding of queens, the multiplying of queens, and the introduction of alien queens had no effect. Lange's conclusion that the behavioral changes were due to alteration in nest odor which, in turn, was caused by the change in chemical environment, is a reasonable one. Thus, with ants as well as with honeybees, dietary differences play an important role (79).

*Auditory communication*—Sound production and hearing in ants has been partially reviewed by Haskell (67), but some further comments are needed here. Although stridulation is widespread in ants, and what appear to be stridulatory surfaces even occur in larvae [leading Wheeler & Bailey (189) to speculate on the possibility of communication in some taxa], little evidence has been adduced for the existence of sound communication. On the basis of careful experimentation, Autrum (2) and Haskins & Enzmann (68) found perception of aerially-borne sound rather weakly developed in ant workers, although perception of solid-borne vibration is acute. In the genus *Myrmica*, Autrum could find no evidence that stridulation functions in recruitment or alarm. Workers ordinarily stridulate only when their freedom of movement is restricted, and this apparently has no effect on nearby sister workers. An elaborate sound-producing organ, including a distinctive muscled vibrator and resonator chambers, was described in *Plagiolepis*, *Leptothorax*, and *Solenopsis* by Nachtwey (118), who used this morphological evidence to postulate sound communication in ants. However, Nachtwey's organ appears (to the present reviewer, who re-examined *Plagiolepis* and *Solenopsis*) to be based on a misinterpretation of articular structures in the propodeum and anterior petiolar peduncle and of the atria of the well-known metapleural (= metasternal) glands. [For complete descriptions of this portion of the body detailing the histology of the metapleural glands in various species see Pavan & Ronchetti (123), Tulloch (167), and Whelden (191, 192, 193).] Field evidence on sound communication is meager. Collart (35) reported that when a worker from a raiding column of *Megaponera foetens* (Fabricius) was trapped in sand 50 cm from the column, it stridulated audibly until it was excavated by other workers drawn to the spot. It is premature, however, to conclude that the rescuers responded to the sound. Exactly the same response is released by the mandibular gland secretion of *Pogonomyrmex badius* (196), and a disturbed *Megaponera* worker may discharge an alarm substance with