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THE NATURE OF THE TAXON CYCLE IN THE MELANESIAN ANT FAUNA*

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The central contribution of biogeography to general biology is the description of the history of biotas. Aside from its relevance to evolutionary theory, biogeographic history has an immediate significance in population studies: we can expect that the role of individual taxa in ecosystems is influenced both by their geographic origin and by their duration as members of the community. Taxa penetrating from arid source areas will probably fill niches different from those filled by related taxa from moister regions. As a rule, newcomer taxa will undoubtedly affect communities differently from related taxa of long residence. Island biotas derived by radiation of limited stocks show important differences from those derived from more diverse "balanced" stocks, and so on. Of all the major factors that shape community organization, the variables of biogeographic history are probably the least understood. This is due simply to the great complexity of the subject and the tedious nature of its study, which requires revisionary taxonomy as the basic analytical instrument.

The purpose of this paper is to extend an earlier effort (Wilson, 1959a) to synthesize certain information on the zoogeography, speciation patterns and gross ecology of a limited fauna, the ants of Melanesia. In the first report just mentioned, only the subfamily Ponerinae was considered. Faunal sources and expansion patterns of the modern ponerine species were deduced; speciation was shown to be accomplished chiefly by multiple invasions accompanied by major shifts in habitat preferences. In this second study the following groups have been added, following more recent revisionary work by W. L. Brown (1958, 1960, and ms.) and the present author (1957, 1958a, 1959b, c, and ms.): Cerapachyinae, Dolichoderinae, and the myrmicine genera Pheidole, Crematogaster and Strumigenys. These include perhaps 50 per cent of all of the known Melanesian ant species. Not all of the taxa were well enough known to include in all of the analyses; hence, the particular taxa employed are cited with each analysis. Numerical data pertaining to the Asian fauna are based on the catalog by Chapman and Capco (1951), extended and corrected wherever possible by more recent revisionary work. Additional data have been taken from the valuable faunal monographs of Mann (1919, 1921). Emphasis has been shifted somewhat to

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