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Trap-Nesting Wasps and Bees: Life Histories, Nests, and Associates. Karl V. Krombein. Washington, D.C.: The Smithsonian Institution, 1957. Smithsonian Publ. 4670. vi, 570 pp. \$12.50.

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REVIEWS OF RECENT LITERATURE

TRAP-NESTING WASPS AND BEES: LIFE HISTORIES, NESTS, AND ASSOCIATES. Karl V. Krombein. Washington, D.C.: The Smithsonian Institution, 1957. Smithsonian Publ. 4670. vi, 570 pp. \$12.50.

The technique of "trap-nesting" for wasps and bees by putting out strips of wood having a hole bored in one end is not exactly new, but only within the last 15 years has it been widely employed in this country. This new book by Karl V. Krombein, chairman of the Department of Entomology at the U.S. National Museum, reveals how enormously productive the technique can be. It is, of course, useful only for species that normally nest in hollow twigs. Species that bore in pith (such as many crabronine wasps) do not usually accept the traps, nor do ground-nesters (which make up the majority of wasps and bees).

Despite its limitations, the trap-nesting technique is extremely valuable, as it allows one to follow the development of the cell contents closely once the nest has been split open, and also because the nests are so simple and inexpensive that it is practicable to use large numbers of them, thus obtaining information on ecology and population phenomena not available from isolated nests. The technique is also useful in summer programs for young people; there is probably no equally simple method for demonstrating some of the complexities in natural environments.

Krombein's study is based on data gained from about 3400 trap-nests put out over a 12-year period in several eastern states and Arizona. In all, he treats 75 species of wasps that accepted his traps, as well as 43 species of bees and 83 species of parasites and predators of diverse groups. Previous knowledge of these insects is reviewed, but in a great many cases nothing at all was known about them. In fact, 5 species of wasps had to be described as new from the Washington area alone, and the symbiotic mites included 2 new genera and 17 new species! If there are persons who feel that descriptive natural history has "run its course" (and there are), they should be closeted with this book for a few days.

Krombein is known for his meticulous attention to detail, and this book is no exception. It is a great compendium of facts, gathered with great

care and in many cases supported by excellent photographs. The author points out many of the biological criteria that characterize genera and species, as well as instances of competition and competitive exclusion, and many unusual phenomena which cannot be summarized here.

For my taste, there might have been more attempts to generalize from this great mass of data. The book is a mountain of rich ore, but the reader is apt to find himself doing a good deal of his own refining. Perhaps this is as it should be; at any rate we may be thankful to have all of this information in one attractive volume, rather than having to ferret it out amid the current information explosion.

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BRIEF NOTICES

THE BIOLOGY OF POPULATIONS. Robert H. MacArthur and Joseph H. Connell. New York, London and Sydney: John Wiley & Sons, 1966. xvi, 200 pp. \$5.95.

This textbook, which can be read just as easily as an introduction to the subject, is one of a series resulting from a 1960 meeting of specialists at which the hope was expressed that "the teaching of biology could be reoriented to convey more effectively and forcefully the intellectual revolution which biology was undergoing." The authors summarize the content well: ". . . we begin by describing the setting, both in time and space, in which populations exist. Then we consider how a population developed its properties by the mechanism of natural selection and how different kinds of populations ('species') arose. After we have evolved specific populations, we. . . in the remainder of the book, determine how they function and how they interact with one another."

There is an interesting appendix of suggestions for laboratory exercises, and the philosophy of experiment is much in evidence throughout the book. The illustrations are well done and effective. *The Biology of Populations* is designed to serve as "part of a demanding introductory biology course," or, with supplementary readings, as a text for a more advanced course in ecology and evolution. Some previous knowledge of elementary genetics and calculus will enable the reader to get the most out of this attractive work.

R.S.W.

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[*The Michigan Entomologist* will be pleased to announce notable forthcoming publications. Publisher's notices and review copies should be directed to the Editor.]