

## BOOK REVIEWS

THE EVOLUTIONARY ECOLOGY OF ANIMAL MIGRATION. R. R. Baker. Holmes & Meier Publishing, New York. 1978. 1012 p. \$97.50.

Robin Baker, author of this monograph, recently wrote that if a book on animal migration "is to achieve more than ephemeral usefulness . . . , it has to score in at least one of two ways. Either it must contain new and original interpretations or theories, or it must be so aesthetically satisfying that it is a pleasure simply to own" (1981, *American Sci.* 69: 561). Baker's own book on animal migration succeeds in *both* ways and, in addition, is a monumental summary (1000+ pages) and synthesis of what's known about the subject.

Baker's book is handsome. It is illustrated with hundreds of original drawings, maps, and diagrams. Even the Taxonomic Index is illustrated—with drawings of migratory animals from aphids to zebras.

Baker's theory of insect migration is at odds with the one that C. G. Johnson (1969) developed in *Migration and Dispersal of Insects by Flight*. Johnson emphasized that most aerial movements of insects are at the mercy of the wind and suggested that even migrating butterflies may be moved more by synoptic weather systems than by their directed flights near the ground. Baker (p. 472), on the contrary, suggests that even the movement of moths may be a matter of their taking advantage of favorable winds and that no one has yet shown that any animals "migrate in any direction and delegate displacement solely to the prevailing winds."

An outstanding feature of Baker's treatment of insect migration is re-analysis of published data. For example, he plots Urquhart's (1960) data on Monarchs and suggests (p. 428) that a significant number of Monarchs may hibernate in tree crevices rather than migrate—an idea that seems as implausible as poor-wills hibernating in rock crevices. (Nonetheless, Baker earlier arrived at a similar conclusion concerning red admiral butterflies in Britain—and vindicated it.)

The book has 3 sections. The first deals with the definition of migration (34 p.) and concludes not so novelly that it is the "act of moving from one spatial unit to another." The second develops a migration model beginning with the concept of *lifetime tracks*—the path of an animal from birth to death—and continuing with mathematical formulae for most aspects of migration (54 p.). Finally the bulk of the book (834 p.) evaluates the model in light of examples from all major groups of animals. The indexes (90 p.) are thorough and are by author (incorporated with list of references cited), geographic locality, subject, and taxon.

This is a book that undergraduate biology majors will browse for enjoyment and that researchers in insect migration will benefit from studying.—T. J. WALKER, Dept. Entomology and Nematology, University of Florida, Gainesville, FL 32611 USA.

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THE NORTH AMERICAN GRASSHOPPERS, VOLUME 1. ACRIDIDAE: GOMPHOCERINAE AND ACRIDINAE. 1981. Daniel Otte. Harvard University Press, 275 p. + 16 color plates, \$45.00.

This is the first of a planned 3 volume work on the identification of grasshoppers of America north of Panama, including the West Indies.

Previous identification guides for this group are Blatchley's *Orthoptera of Northeastern America* and Helfer's *How to Know the Grasshoppers*, etc. Both are somewhat out of date nomenclaturally and both are out of print. Current literature has been published by several authors in many journals; anyone wishing to identify grasshoppers had to acquire these articles individually. Dr. Otte has admirably fulfilled the need to collect all up-to-date literature into one book, at the same time incorporating his own expertise and illustrations.

The introduction contains a brief history of grasshopper taxonomy, a substantial section on mating behavior and sound production (areas of particular interest to Otte), and a key to families of grasshoppers in the broad sense. Also included is a very well illustrated key to genera. General geographic distributions are given in the key for most genera, allowing faster progress through the key. The introduction could benefit from the addition of a brief discussion on collecting and preserving techniques. Many characters require at least partial exposure of a hind wing, and proper color preservation is also important. There is no mention as for whom the book is intended; Otte's format will allow efficient use by amateurs and specialists alike.

The reader will at once be delighted with the color plates which depict every species discussed and are reminiscent of a Peterson *Field Guide*. Two additions to the plates would have been helpful: page references to the text, and a note explaining that unless labeled otherwise, the pictures are those of males. Anyone apprehensive of keys will like Otte's format, as keys to species are used only for the larger genera (*Orphulella*, *Silvitettix*, *Mermiria*, and *Boopedon*). Species identification in other genera is achieved by consulting a list of distinguishing characters until all but one name can be ruled out, although Otte abandoned this approach with the genera *Bootettix* and *Rhammatocerus*. Though unconventional, this method allows correct identification as easily as do keys in most cases.

Both subfamilies are divided into genus groups, under some of which are lists of genera with characters that reiterate those used in the generic key. The discussion of each genus contains the distribution of the genus, and references. There is also a paragraph on recognition which is unnecessary for identification since the reader presumably knows the genus of a specimen, having consulted either the generic key or the genus group discussion.

For most species there are sections on distribution, recognition, life cycle (usually the season of adult occurrence), habitat, and references. Perhaps equal in value to the descriptions are the excellent range maps given for nearly all the species. Rather than hypothesizing actual limits of distribution, Otte shows where the species have been collected. Since many gomphocerines are restricted to the western states or Central America, the task of identifying an eastern species is not as imposing as it might seem. Following Otte's classification, Floridians can be sure that their ubiquitous species of *Orphulella* is *pelidna*; none of the other 15 congeners has been found in Florida.

A section on behavior, usually the visual and acoustical mating signals, is included for many species, often based on Otte's own research. A section on intergeneric relationships appears for most genera through page 61, and suddenly stops, although affinities of subsequent groups are no more obscure.

One will question why *Eritettix simplex* received a section on variation, instead of having this topic discussed under recognition, as in the rest of the book. A paragraph labeled taxonomy appears sporadically for genera and species on pages 106 to 208. Since this subject is thoroughly covered in the appendices, it is extraneous to the text.

Appendices 1 through 3 deal with nomenclatural history of all species recognized in the text; changes made by Otte for this volume are conveniently collected in Appendix 1 as well as appearing in the genus (Appendix 2) and species (Appendix 3) treatments. Since name changes generally do not concern the non-specialist trying to put a name on a specimen, Otte has sensibly reserved them for the appendices (except as noted above).

Appendix 4 shows the trend acridologists have taken in placing genera in the Gomphocerinae instead of the Acridinae or Oedipodinae. Such higher taxon changes reflect the healthy influence of the new systematics on the understanding of grasshopper phylogeny; emphasis in Otte's book is placed on characters of fundamental importance such as stridulatory pegs on the hind femora.

Otte states that his classification scheme may be opposed by some specialists, but such is the case with any work of this kind. Very few typographical errors were found. The book will greatly facilitate identification of the acridid species for biologists of any discipline or level of expertise. One may jump at the price, however. The volume is not so large as to prohibit paper binding, which would make it much more economical and attainable. Volumes 2 and 3 should be watched for with anticipation.—SCOTT GROSS, Dept. of Entomology and Nematology, University of Florida, Gainesville, FL 32611 USA.

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INSECTS: AN ANTHOLOGY OF ARTHROPODS FEATURING A BOUNTY OF BEETLES. Paintings by B. Durin, introduction by P. A. Gette, and entomological commentary by G. Scherer. 1981. Hudson Hills Press, Inc., N. Y. \$50.00.

By far the outstanding feature of this book, *Insects*, is the collection of full-page, full-color paintings (32 of insects and 2 of arachnids) by the Frenchman, Bernard Durin. His paintings depict species from several insect orders—Diptera, Hemiptera, Homoptera, Hymenoptera, Lepidoptera, and Orthoptera; however, Coleoptera appear most often, comprising 16 of the 34 plates.

Durin's illustrations are rich with color and full of details such as pores, hairs, and even the tiniest tarsal claws. He has successfully rendered various textures and iridescent and metallic qualities often observed in insects. Moreover, his paintings are life-like and scientifically accurate. In several instances the insects appear to have momentarily paused on the page on their way to somewhere else.

A collection of quaint literary excerpts precedes Durin's illustrations. These, introduced by Paul Armand Gette, a French naturalist and natural scientist, are from the works of 21 Western authors including Fabre, Hardellet, and Thoreau. Gette himself discusses the history of the present day classification system and why early literature and art about insects included such creatures as arachnids.