the meeting over to the new Chairman, Howard E. Dorst, who congratulated Walter Ebeling for organizing one of the best meetings of the Branch. Chairman Dorst continued to outline the progress that had been made towards the next year’s meeting in Salt Lake City.

... to cyanide; also, with reference to locality labels, that some qualification had been made to the advice that the nearest post office should be listed as the place where the specimen was found.

The author is an Associate Professor, University of Toronto, and is well known for his study (partly by tagging specimens) of the migratory habits of the Monarch butterfly; he also has made ecological studies of the Orthoptera of southern Ontario. This is a creditable little book, definitely for beginners, not for advanced students.

Ashley B. Gurney
Entomology Research Division, ARS U. S. Department of Agriculture


The outstanding value of this book is suggested by the success of its 1928 predecessor, “Locusts and Grasshoppers,” and by the long experience of its author. Sir Boris has worked with Orthoptera about 55 years. He was Director of the Anti-Locust Research Centre, 1945-59, and his broad accomplishments led to knighthood in 1961.

The present work is not merely a revision of the 1928 volume, but it is entirely new, and designed not as a complete handbook for the study and control of locusts and grasshoppers (the intent in 1928), but rather as an introduction providing basic knowledge and drawing upon data from individual species to illustrate general points. The tremendous amount of published data is divided by stressing the review and interpretation of laboratory findings in vol. 1, then emphasizing the “behavior, ecology, biogeography, population dynamics, economics and principles of rational control of grasshoppers and locusts” in vol. 2, still in preparation. The change of title from that used in 1928 is deliberate, to emphasize the general characteristics of grasshoppers as a group, only a few of which are migratory and warrant the term “locust.” The large amount of laboratory data reflects the increased use, in recent years, of these insects as laboratory animals. However, there are still numerous gaps in the information available on many aspects of grasshopper biomics, and this book will probably stimulate the filling of the gaps, as its author hopes.

Both in the text and illustrations, some made especially for this work, explanation of fundamentals and the interpretation of the results of other investigators are presented clearly. The book will doubtless be a standard reference for acridologists, thereby having great influence on terminology, as, for instance, hatching, fledgling, and hopper (p. 273, 295), which terms now are not used uniformly everywhere, and meioperism (p. 29) with its several degrees of long and short wings.

... the chapter on phase polymorphism is an excellent review of the subject, though aspects dealing with field observations primarily will appear in vol. 2. Modestly, Sir Boris credits Faure in South Africa and Plotnikov in Central Asia with sharing with him the distinction of independently realizing that periodic swarming of locusts is correlated with changes in coloration and morphology, though I believe it is fair to say that his own 1921 paper and his 1928 book at least up to about 1930, were the major sources of information for most biologists until this then critically new idea. Originally, the phase theory seemed to emphasize its importance in explaining the periodicity of locust plagues; certainly, the importance was there, but it detracted from a search for biological aspects.

Furthermore, some critics attempted, as years passed, to define phases by morphological criteria alone, without much attention to biometrics and ‘deep physiological differences.” Thus, though much need remains for basic information, knowledge of phase transformation has matured greatly. There is a strong emphasis on crowding of individuals in the development of phase characteristics; in fact, the phenomenon seems essentially to be a “whole complex of responses of an insect to the population density.” It is now known that a fairly large number of grasshoppers not regarded as locusts show some manifestations of phase polymorphism; also that comparable responses occur in several other groups of insects. It is interesting that Sir Boris is unconvincing that constant-temperature cabinets are necessary for certain laboratory rearings, or that such statistical refinements as discriminating functions necessarily are the best method of analyzing locust morphometrics, in view of the labor and specialized knowledge involved. Preference for the term “solitarious,” rather than “solitary” for isolated individuals, in contrast with “gregarious,” or crowded, is stated.

The introduction to taxonomy stresses the importance of precise identification, and practical definitions are given for family, genus, species, cline, and individual variation. The final chapter, an illustrated outline of the classification of Acridoidea, gives the latest views on arrangement of typical grasshoppers, excluding Tettigidae, Eumastacidae, Proscopiidae, Tanaoceridae, and Pneumoridae, each regarded as representing a distinct superfamily.

There are 10 families of Acridoidea, and concerning them as well as the 19 subfamilies of Acrididae there are some modifications of the classification outlined by Dr. V. M. Dirsh in 1961, probably in part owing to the latter’s more recent researches. It is noteworthy that the Oedipodinae are again regarded as a valid group, and that the majority of familiar genera of “slant-faced” grasshoppers formerly placed in the Acridinae are now placed in the Gomphocerinae. So, the classification of grasshoppers continues to evolve, and in this respect, as well as others, the book is an important reference source. Coupled with discussions of individual families and sub-

There being no further business the meeting was adjourned.

Respectfully submitted,
William W. Allen
Secretary-Treasurer

BOOK REVIEWS

(Continued from page 386)
families are lists of all species mentioned in the text, with some of the most frequent synonyms; thus, the relationship of each species may be seen at a glance. Throughout, an attempt is made to use the currently correct scientific names of all species discussed.

The bibliography is carefully selected and consists of 1415 titles in 11 languages. It is interesting that about 45 papers, wholly or in part authored by the American physiologist Dr. Eleanor H. Siffer, comprise the largest group listed for one entomologist.

Printing and binding are excellent. On page 347, reference to "fig. 19, A" may puzzle inexperienced readers; it is a mistake for fig. 9, A, on page 12. About a half-dozen other errors of printing or slight lapses, that I have noticed, are too unimportant to list.

This is a notable book of great and permanent value, a "must" not only for acridologists but for biologists whose interests encompass this subject material.

ASHLEY B. GURNEY
Entomology Research Division, ARS U. S. Department of Agriculture


The senior and junior authors of this book, who teach at the University of Arkansas and Ferris State College, Mich., respectively, have defined applied entomology as the management of insect populations to the end that human welfare is served. Their goal has been to present concepts and principles for college-level readers so that, with an understanding of basic concepts, problems may be analyzed and correct decisions reached. The book is designed for a general course in applied entomology and as a supplemental text in more specialized courses.

The first chapter is, somewhat anthropomorphically, entitled "The Needs and Capabilities of Insects" and is a very brief discussion of aspects of structure, physiology and adaptation. The orders of insects are surveyed in Chapter II (25 p.). Subsequent chapters deal with the natural environment, geographical and seasonal distribution, environmental management, the economic approach to insect control, and various aspects of control with emphasis on the use of chemicals.

The authors are to be commended for their ecological point of view, which is clearly evident throughout the book. The discussion of environmental management is particularly well presented. The chapters on chemicals and chemical control provide excellent summaries of the subject matter. Especially worthwhile is the explanation of the registration of insecticides and the setting of tolerances. Referring to the Congressional investigations preceding the passage of the Miller Amendment, the authors' forthright comment is, "The hearings were time-consuming and totally unsatisfactory to an eager agriculture, an overworked Congress, and a harassed chemical industry."

Professional entomologists must have a thorough understanding and appreciation of the principles and basic facts set forth by Rolston and McCoy. The content of parts of books by Wardle and Buckle (1923), Wardle (1929), and Fenton (1952) is comparable but in many respects now obsolete. Students majoring in entomology should delve more deeply into the concepts presented by Rolston and McCoy. Their book is perhaps most valuable to students majoring in entomology, but such students must in addition receive at least a smattering of information about the structure, biology, and classification of important insect pests.

The book is well written though there are a good many choppy sentences and a few peculiar or meaningless phrases and statements such as, "The value of a predator in controlling a noxious insect depends upon the degree to which it possesses certain characteristics." Typographical and spelling errors and faulty literature citations are few. The figures are unimpressive, and at least a few photographs would have been most appropriate.

WILLIAM E. BICKLEY
Department of Entomology
University of Maryland
College Park


This is an excellent addition to the Cambridge Monographs in Experimental Biology. The first 10 chapters present (1) the organization of the arthropod nervous system, (2) the significance of intracellular and extracellular water and the osmotic activity of the principal solutes in nerves, (3) the distribution of inorganic ions and their relation to the electrical activity of the nervous system, (4) the relationship of ionic effects to the mechanism of nervous transmission, (5) energy requirements of nervous transmission, (6) the importance of carbohydrates as an energy source and the relationship of carbohydrate metabolism to the arthropod nervous system, (7) the role of amino acids as proteins, energy source, synaptic transmitter substances, and compounds important to the maintenance of the osmotic equilibrium of nerve cells, (8) lipids as a major constituent of the arthropod nervous system and their relationship to the continuance of normal electrical activity, (9) the role of acetylcholine as a mediator in the transmission of impulses between nerve cells and at the neuromuscular junction, and (10) compounds other than acetylcholine that are likely to be involved in synaptic transmission mechanisms. Chapter 11 is a brief summary of the most significant information in the preceding chapters. Complete references occupy 21 pages at the end of the book. A brief addendum relates additional references to specific pages in the book. An index of subjects is quite adequate.

Much of the information in the earlier chapters is a review of published data. However, this is justified when one sees how the information is used as a basis for explanations and hypotheses in the later chapters. The available evidence indicates that many of the cytological features of the synaptic regions in the central nervous system of arthropods are similar to those in the vertebrate nervous system. The author maintains that in the case of the insect central nervous system there is strong circumstantial evidence that acetylcholine, in vesicles in the presynaptic cytoplasm, is the mediator of synaptic transmission. However, this compound does not appear to be involved at neuromuscular synapses. Limitations of space apparently prevented any description of the diverse structure and role of chemicals that act as cholinesterase inhibitors. A discussion of neurosecretory phenomena was omitted for the same reason.

P. A. DAHM
Department of Zoology and Entomology
Iowa State University, Ames


This well-printed and sturdy bound volume contains four papers on insects and three on plant diseases. The pests of safflower, the economic importance of which has recently increased, are surveyed in Israel by Z. Avidov and E. Kotter. Phenological information about the 46 pests also is presented. A more precise evaluation of damage caused by the different insects would have made