for that of France. Aside from MacGillivary's almost useless treatment of the Tenthredinoidea in the *Hymenoptera of Connecticut*, there is still no single modern taxonomic work dealing with the classification to species of sawflies for any state, or sizable locale, in the United States.

KENNETH W. COOPER

Princeton University

Wildlife management: upland game and general principles. Reuben Edwin Trippensee. New York-London: McGraw-Hill, 1948. Pp. x + 479. (Illustrated.) $5.00.

Workers and students in the field of wildlife management have long looked for a textbook to report the information that has so rapidly accumulated since the publication in 1933 of Aldo Leopold's classic *Game management*. Trippensee's work accomplishes this purpose admirably in several phases of the field.

Dr. Trippensee has been a wildlife research worker and teacher for 20-odd years in the Lake States and New England. His discussions of wildlife problems and bibliographies amply reflect this long period of work.

About four-fifths of the text is devoted to discussing three broad classes of wildlife—farm, forest, and wilderness—and to summarizing information on the ecology and management practices for the various species of wildlife considered as typical of these broad divisions. In general the information is well presented, though its order offers some problems. For instance in describing the technique of "Evaluating the Rabbit Range" on page 34 it is suggested that the reader turn first to the section on "Evaluating the Pheasant Range," some 42 pages later. The material for the Lake States area is much better than that for the western or southern sections of the United States.

The remaining fifth of the book deals with "Miscellaneous Wildlife Relationships" and "Wildlife Administration." These two sections are in the main adequate and sound summaries of predator problems, game harvest, refuges, winter feeding, administration, and technical training in the field of wildlife management. However the chapter on variations in animal numbers seems inconclusive to the reviewer.

After defining cycles in a way that seems to ignore quantitative data (he speaks of "noticeable scarcity" and numbers that "attract attention" in referring to population densities) Trippensee seems to argue around the question, through constantly leaning towards the "cosmic theory" as a basis of cycles in animal numbers. By using averages, he may well have masked the variations in time between dates of periods of abundance. Much of the data presented indicates both a lack of uniformity in time interval and also a lack of uniformity in the causes of decline in animal populations. In view of this, the term "cycle" as he uses it has little meaning in the commonly accepted sense of the word.

The reader will note that such important forms of wildlife as migratory birds and fur-bearers are not mentioned in the review. Trippensee states that "these, with a section on game fishes, were written but not published because of the difficulty of publishing and marketing as large a volume." It is hoped that these sections will be made available at a later date.

WILLIAM H. MARSHALL

University of Minnesota

Larger imperforate Foraminifera of South-Western Asia: Families Lituolidae, Orbitolinidae and Meandropsinidae. Francis R. S. Henson. London, S.W. 7, Engl.: British Museum (Natural History), 1948. Pp. xi + 127. (Illustrated.) 1£ 10/–.

This work is on the Foraminifera of a relatively new area. Very little has been published on the older formations of this region. The Foraminifera of only three families are included, one of which is new. Besides this, 14 new genera, 27 new species, and six new varieties are described. The various forms have complex internal structures and the plates show many thin sections to illustrate these structures. A glossary of the many special terms is included, and keys to the genera of each of the three families are given. Detailed text figures show developmental stages and the relationships.

The development and phylogenetic relationships of various forms belonging to these three families are discussed in detail and add much knowledge to the early developmental stages in these complex forms. The bearing of these stages on the evolutionary development is quite complex and much is still to be discovered regarding their usefulness in determining the true relationships of the various genera and their position in a true classification of the groups. Many gaps are yet to be filled in by future studies. These discussions of the various stages and their relationships to one another and to stages of other groups should make a decided advance in our knowledge of the three Foraminifera families concerned. The work should inspire others to add to our knowledge and to check the various relationships.

JOSEPH A. CUSHMAN

Sharon, Massachusetts

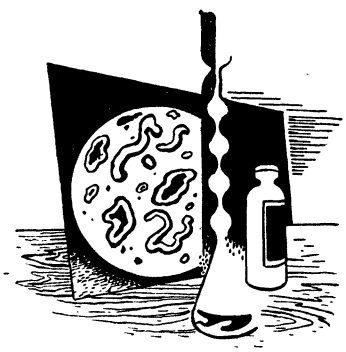
Animals without backbones. (Rev. ed.) Ralph Buchsbaum. Chicago: Univ. Chicago Press; London: Cambridge Univ. Press, 1948. Pp. xii + 405. (Illustrated.) $5.00.

No one will be as startled or as excited about this new edition of a highly successful text as people were about the book in its original form in 1938; the novelty of the excellent illustrations and simple, direct style has worn off. Yet it is clear that while the former edition was going through its seven printings, Dr. Buchsbaum was busy finding ways to improve his book. The new version has grown by only 34 numbered pages, and most of this is in an added final chapter entitled "Further Knowledge." In this new section and the accompanying four new pages of gravure photographs, the student is introduced carefully to such helpful material as information on biological field stations, scientific journals, and biblio-

graphic procedure. A selected list of journals, advanced texts and treatises, and books on special aspects of the invertebrates is followed by a reprint of three scientific articles in their original form: "The Characters of *Pelmatohydra oligactis*" (Pallas) by Libbie H. Hyman; "Notes on Locomotion in *Pelomyxa carolinensis*" by Charles G. Wilber; and a short piece by W. L. Doyle and E. K. Patterson, "Origin of Dipeptidase in a Protozoan." These are presented in such a way as to encourage the student to make further acquaintance with biological literature.

Significant additions have been made to the photographic presentation of protozoans, sponges, and protochordates. New pictures of *Peripatus* and *Liguus* are especially striking. Photographs of living material have replaced pictures of museum models in several instances, and better cuts have been prepared from previous illustrations. Often the rearrangement of earlier illustrations has been surprisingly helpful, as for example in the case of the photographs of trapdoor spiders and nests. Only one cut, showing a pair of fruit flies, struck the reviewers as below the high standards set elsewhere. Better placement of the gravure pages, to correspond more closely with the text material, is another important improvement. All gravure pages now are numbered for easy reference; the new index draws attention to each illustration in its proper place.

LORUS J. and MARGERY J. MILNE
University of New Hampshire



Bacterial and mycotic infections of man. René J. Dubos. (Ed.) Philadelphia-Montreal: J. B. Lippincott, 1948. Pp. xiii + 785. (Illustrated.) $5.00.

Viral and rickettsial infections of man. Thomas M. Rivers. (Ed.) Philadelphia-London: J. B. Lippincott, 1948. Pp. xvi + 587. (Illustrated.) $5.00.

The first book, like its companion volume on viral and rickettsial infections of man, represents the combined efforts of several specialists in the field of infectious diseases to present a source of information primarily for medical students—in this case on bacterial and mycotic infections. As such, it may be considered a textbook of medical bacteriology.

Using the approach so ably elaborated by Theobald Smith, the stated emphasis is on host-parasite relationships; the biological characteristics of the invaders, the total response of the invaded, and the forces, natural and artificial, which may alter the balance in favor of the host are integrated to complete the picture. The first nine chapters, devoted to a consideration of general background such as history, the nature and properties of bacteria, the problems of infection, and the fundamentals of immunology, serve to elucidate the general philosophy of the book. The major part of the book, 25 chapters, dealing with a consideration of groups of bacteria and fungi with their special characteristics and disease-provoking potentialities, and therapeutic considerations of their clinical effects, presents a well-rounded picture of standard infectious diseases. Four concluding chapters consider sterilization, chemotherapy, epidemiology, and diagnostic procedures in general.

The book is printed with large type on hard finish paper which is well suited for the illustrations. Unfortunately, the size of the book is somewhat awkward; a single-column format with smaller pages, even though necessitating a thicker volume, would be easier to use.

On the whole, the book meets some of the needs of medical students. Representing as it does the work of many individuals, it might be expected to be more unevenly presented; that there is so little unevenness is to the credit of the editor. A few chapters suffer from too great a tendency toward a monographic style, and whereas they are excellent reviews for the specialist, they seem to be more involved than necessary for the beginning student. There is some minor duplication of material, but the different approaches of the authors prove stimulating. The chapter on the streptococci may be singled out as an excellent, up-to-date, and comprehensive review of an involved subject, presented in an exceedingly stimulating manner.

The bibliographies are adequate, but not as complete as might be desired.

This book should be of value to students, and could serve as a textbook; but its greatest worth, in the reviewer's opinion, will be as a reference volume for the initiated rather than as a primary source of information.

The field of human viral and rickettsial infections differs from the strictly bacteriological field in that it is not so well stabilized and also there has not been a plethora of textbooks on the subject. For these reasons the second book reviewed stands somewhat apart from its companion.

The subject is introduced in five chapters covering the nature of viruses and the techniques available for their study. A chapter on epidemiology stresses the special features of viral diseases but also covers the general problems of infectious disease transmission. A chapter on bacterial viruses, while not contributing directly to an understanding of human disease, is definitely in order as an aid to understanding virus behavior in general. The remainder of the 37 chapters cover in detail the specific human diseases caused by well-established viral and rickettsial agents, together with a few, such as exanthem subitum and infectious mononucleosis, for which the etiologic factors are still somewhat vague. In each case, a well-rounded picture of the clinical condition, the known