southern tip of South America and none on the Falkland Islands. A compilation of altitudinal records shows few above 10,000 feet (3050 meters) with two doubtfully at 16,395 feet or 5000 meters, snowline on the peak of Mt. Orizaba, Mexico and near snowline in the Himalayas. This is curiously similar to the altitudinal distribution of ants.

Of the 17 families of bats comprising some 2000 known forms, hibernation takes place mostly in Vespertilionidae and in a few species of four other families.

The author reared bats successfully on a diet of *Tenebrio molitor* larvae with added vitamins. The Scandinavian species are all insectivorous and all drink much water. They fly to water surfaces and repeatedly dip the snout into the water as they fly over it. Besides their supersonic sounds the bats make buzzing sounds while flying and in connection with other activities, such as eating or sneezing.

The valuable embryological data include what is stated to be the first certain observation of triplet birth in the Old World. The author believes that he has obtained unquestionable evidence of pregnancy in the spring following fertilization in the autumn.

The plates consist of a heterogeneous assortment of small photographs, some not clear. They show very well, however, the nesting sites and the general habitus of the Scandinavian bats. A photograph of twin bats with only four instead of five toes is stated to be the first known case of hypodactylia.

The bibliography of 41 pages deals with world literature and is an important asset.

The author is to be congratulated on this excellent monograph, and it is to be hoped that the investigations on broad biological problems and parasites will continue. The University of Lund deserves credit for undertaking the publication of what in this country would be an expensive book.

NEAL A. WEBER

University of North Dakota

The avian egg. Alexis L. Romanoff and Anastasia J. Romanoff. New York: John Wiley; London: Chapman and Hall, 1949. Pp. xiii + 918. (Illustrated.) $14.00.

The title establishes the theme of this volume but it does not suggest its encyclopedic nature. As the authors state: "This book represents an attempt to compile all the facts known about the bird's egg." Their findings have been arranged into three main divisions: morphogenetic expression, biophysicochemical constitution, and bio-economic importance. There are 424 figures and a wealth of tables. The bibliography contains over 2,500 references, but unfortunately does not include the titles of the articles.

The book is written in clear and simple language and may be unstintingly recommended to a broad spectrum of readers, from the research worker to the laity. Serologists may be a bit annoyed at the references to "immunological" properties, and the bacteriologist will probably chafe because of the somewhat superficial coverage of the chick embryo, since the bibliography contains no citations of the work by Woodruff and Goodpasture or F. M. Burnet. But the book fills a real need.

MALCOLM H. SOULE

University of Michigan

Faune de France: Hyménoptères Tenthredoïdes. (No. 47.) L. Berland. Paris (VI^e), France: Paul Lechevalier, 1947. Pp. 496. (Illustrated.) 1,500 fr.

This well-illustrated volume is the fourth monograph on Hymenoptera contributed to the *Faune de France* by the versatile and indefatigable Lucien Berland. Like the other three, which treat of the aculeate Hymenoptera exclusive of ants, this descriptive work on sawflies will prove a very useful adjunct to the American entomologist's library.

Following a very brief review of the morphology and biology of adult and larval sawflies, Berland enters upon the taxonomic analysis of all families, genera, and species of sawfly known to be represented in the fairly rich fauna of France or its immediate environs. The diagnoses are concise and lucid, and in the case of genera are generally supplemented by very satisfactory illustrations of the habitus of one or more included species, or of the anatomical characters employed in the keys. Appended to the descriptions of most genera are brief notes on the biology (generally food habits) and world distribution of their representatives. Where possible, much more extensive notes are given for each of the more than 500 species described. These include not only records of food plants and feeding habits of larvae, brief descriptions of larvae, sites of cocoon formation, parthenogenesis, and so on, but also extensive lists of parasites. Very valuable to the entomologists interested in the comparative biology of European and American sawflies is the careful and detailed documentation of these notes, a fact partially accounting for the large bibliography of about 500 references.

Supplementing the text are tables of information that are of special interest to collectors, economic entomologists, and more general biologists. There is a list of French sawfly species whose parthenogenetic attributes are known or conjectured, a list of sawflies known to be harmful to cultivated plants, and finally a list of plants, whether of economic importance or not, with their known sawfly consociates. A systematic index of more than 30 pages concludes the work.

As stated earlier, this book will be quite useful to students of the taxonomy of American sawflies. Representatives of about three-fourths of the more than 90 genera figured by Berland are found in this country, and Berland's illustrations of the habitus of numerous species will prove welcome supplements to the figures of isolated anatomical parts illustrating H. H. Ross's superb and indispensable *Generic classification of the Nearctic sawflies.* It is to be hoped that one day someone will do for the American fauna what Berland has done so well

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-