Baldwin is a welcome contribution to the somewhat neglected astronomy of the solar system.

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Island life: a study of the land vertebrates of the islands of eastern Lake Michigan. (Cranbrook Institute of Science, Bull. No. 27.) Robert T. Hatt *et al.* Bloomfield Hills, Mich.: Cranbrook Institute, 1948. Pp. xi + 179. (Illustrated.) $4.00.

Insular plant and animal populations have always held a peculiar fascination for the student of natural history, partly because they provide opportunity to observe, record, and deduce without the harassment of the almost innumerable impinging factors that must be reckoned with in a comparable mainland study. Here there is land, there, water; the boundary line is sharply drawn, confining the terrestrial fauna, for the most part, within the area it circumscribes.

Island life is a progress report presenting the results of seven years' study of such an insular fauna. The study, jointly sponsored by the Cranbrook Institute of Science and the University of Michigan, covers 17 islands lying off the Lower Peninsula of Michigan. Mammals, birds, reptiles, and amphibians are considered, both as to distribution and as to habits that have effected the presence or absence of certain forms.

The study is well conceived, particularly in that it includes research into the geological and cultural history of the islands. The geological history, specifically the postglacial history, indicates that, following the recession of the glacial sheet, the water level dropped to around 200 feet below its present level. This provided land bridges between the islands and the mainland, but there seems little evidence from the faunal lists that these land bridges contributed materially to the distribution of the various vertebrates considered. In part, this may be due to the fact that the lake level subsequently rose around 300 feet, covering all the smaller islands, and the bulk of the larger ones. In any case, the authors hesitate to ascribe the present distribution of any form primarily to land bridge invasion.

The cultural history is interesting to the extent that man has superimposed certain introduced species (gray and fox squirrels, raccoon, and deer) extirpated others (elk, cougar, wolf, bear) and provided temporary haven for certain of man's common commensals (house mice, wharf rats, and English sparrows). The greatest single human influence seems to have resulted from the cutting of the original forest, opening the islands to many edge-dwellers that would not otherwise be there at all.

Just how the majority of terrestrial vertebrates reached the islands is open to speculation. Some undoubtedly came of their own volition—over the ice, through the water, or through the air. Some may have come via the land bridges. It is probable that some came in by drift, and evident that others were brought in by man.

The authors have been thorough in their consideration of the material at their disposal. However, one cannot help but feel that the summation may have been somewhat premature. Nearly every page poses questions that must go unanswered pending further investigation. It might be wished that one of the participating institutions would set up a permanent biological station on some one of the islands, and embark upon a 10- or 20-year program of study. Only thus could such phenomena as the relative paucity of species on the islands, as compared to the mainland, be explained. Even the largest island, Beaver, 58.4 square miles in area, and with nearly the same number of plant communities as the mainland, sustains less than one third the number of animal species.

As a progress report, *Island life* is excellent. It is well illustrated, the faunal lists are well annotated, and the analyses of the results to date are intriguing. As a stimulant to speculation and to further research, it is outstanding. The serious ecologist and vertebrate zoologist might ask for a more detailed record of specimens, localities of collection, and habitats, perhaps with maps. Such an expansion of the work would have made it more valuable to future field workers.

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Studies on bats and bat parasites. Olof Ryberg. Stockholm, Sweden: Univ. Lund and Zool. Lab. Agr., Dairy, and Hort. Inst. of Alnarp. Pp. xvi + 330. (Illustrated.)

This voluminous publication is taken from a greater study of many years' duration. It is largely a biological account or natural history of Scandinavian bats, but the information is equally relevant to the study of North American or other bats. Thirteen pages and eight plates deal with bat parasites and these chiefly the ectoparasitic *Diptera* of the family Nycteribidae.

The geographical distribution of bats of the world is dealt with by families in the text and in individual maps. Detailed maps are given for north European species. It appears that there are very few records of bats' approaching the Arctic Circle. Few, if any, occur in strictly polar regions, and none apparently in the treeless tundra, where these predominately cave and arboreal mammals could hardly be expected to be found. Ryberg remarks on the difficulty of establishing the northern limit of bat distribution in Siberia because of the "inaccessibility of the Russian literature." In Iceland bats occur only as stragglers, two North American species having been taken during the second world war. Few species occur at the

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.

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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.

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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