

Warehouse Life

Mice All Over. PETER CROWCROFT. Dufour, Chester Springs, Pa., 1966. 135 pp., illus. \$5.

This is a "popular" book, which means that it can be understood by all persons over the age of puberty. It can also be enjoyed, which means that earnest students may not wish to be caught reading it. Not only does its style owe more to Rabelais than to the *Journal of Comparative and Physiological Psychology*, but in the final scene, the author, camped in the middle of an Australian mouse plague and clutching unto himself the sacred texts of Animal Ecology, decides against adding an intellectual postscript to his light-hearted narrative. In spite of (or because of) its author's refusal to take himself too seriously, this book presents one of the most instructive accounts of self-regulatory behavior so far given for any small-mammal population.

Most of the observations were made on well-fed mice living in pens in an Air Force building formerly used as a bombing trainer. The work was part of an applied zoological problem—that of controlling house mice living among unlimited supplies of food in the warehouses of postwar Britain. Applied science, to be successful, makes severe demands on the investigator's ability to select just so many and no more of the infinite number of fundamental problems he might pursue. The present book is a good example of correct selection; it also avoids the professional obsession for documenting in full those voluminous trivia commonly regarded as necessary evidence for even the simplest truths.

To Medawar's question "Is the scientific paper a fraud?" the answer is normally yes. To the same question about this book the answer is unequivocally no, for the author uses a vivid and fast-moving autobiographical style to describe the genesis and testing of his ideas. His conclusions may even be true, for though conditions were artificial the inmates of these particular concentration camps had a commandant who was full of the milk of murine kindness.

Many of these findings have already been published in respectable scientific journals; but the present book makes better reading—at least for those who can stand the shock of having mouse behavior described in human

terms and of finding subordinate mice described as tramps and hobos. I do not know how high a percentage-science rating this book would receive from J. P. Scott (*Science*, 4 Nov. 1966; see also 3 March 1967, p. 1058); those who might feel embarrassed about enjoying this kind of literature should ask the publishers to mail them *Mice All Over* in a plain envelope.

DENNIS CHITTY

Department of Zoology,
University of British Columbia,
Vancouver

Fossil Animals

Vertebrate Paleontology. ALFRED SHERWOOD ROMER. University of Chicago Press, Chicago, 3rd ed., 1966. 478 pp., illus. \$10.

Alfred Romer does a great service in offering this thoroughgoing revision of his well-known textbook and reference work. The new introduction includes a brief statement on the synthetic theory of evolution, explosions, so-called "orthogenesis," convergence, and parallelism. There is a discussion of the possible echinoderm ancestry of the chordates. There is additional material on the ostracoderms in chapter 2, with further elaboration of the author's theory of freshwater ancestry of vertebrates—a warmly debated hypothesis. The classification of the placoderms is modified, and the acanthodians are tentatively bracketed with the Osteichthyes. There is a new section on the pavement-toothed sharks (pp. 40–41) and modified views on the ancestry of the chimaeras.

Classification and phylogeny of the bony fishes are considerably revised. The old subclass Choanichthyes is now given the name Sarcopterygii because of lack of functional choanae in some lung fishes. This is at least the third time a new name has been proposed for this group. Romer's proposal is perhaps more definitive and appropriate, but there might be some reason to protest the changing of names on grounds of appropriateness. Many of the Amphibia are not amphibious, and not all reptiles are creepers.

The author's views on the evolution of vertebral structures in the Amphibia are elaborated, and the classification is based principally on vertebral features. The subclass Lissamphibia includes the recent families, which are

now united under this category, in contrast to earlier wide separation of the tailed and tailless forms. The Devonian Amphibia (Ichthyostegalia) are now better known, owing largely to the investigations of Erik Jarvik, and receive a more detailed treatment. The anthracosaurs are placed in a central position as ancestors of the Reptilia. Most astonishingly, *Diadectes* is now regarded as a Seymourian anthracosaur rather than a cotylosaur.

Among the reptiles there is substantial new material on the procolophonians, with *Nyctiphruretis* included in that group with some hesitation. *Bolosaurus* remains an aberrant puzzle and is placed alongside the millerettids. The turtles are derived from aquatic or semiaquatic ancestry. The Araeoscelidia are believed to have included *Protorosaurus* and its possible relatives *Trachelosaurus* and *Tanystropheus*. These are doubtful points. *Prolacerta* is placed with the eosuchians but is admittedly close to the lizard ancestry. There is room for some argument here. Lizards are divided into five infraorders, and a description of the Triassic "flying" lizard *Kuehneasaurus* Robinson is provided. There is additional information on *Euparkeria* and the proterosuchians. Among the dinosaurs, the infraorder Prosauropoda is adopted for certain Triassic saurischians. The section on carnosaurs and sauropods is revised. Among the birds, *Archaeornis* is reduced to synonymy with *Archaeopteryx*. There is an interesting review of the palaeognathous origin of the "ratites," and difficulties in understanding the historical relationships of the many orders of "modern" birds are mentioned. Following many recent discoveries, the therapsid reptiles come in for extensive treatment. Efremov's Pthinosuchidae is regarded as a primitive ancestral suborder derivable from sphenacodont pelycosaurs, and there is an almost entirely new discussion of the mammal-like reptiles.

Emphasis on brain structure enters the preliminary chapter on mammals. There is an interesting discussion of the relationships of Mesozoic mammals and a critique of various proposals to redefine the class Mammalia and include or exclude certain primitive forms. A conservative classification is adopted with recognition of the multiple appearance of several mammalian features among the advanced therapsids. There is a revised discussion of the insectivores and primitive primates.

The plesiadapoids are retained among the Insectivora. The history of man is briefly rewritten, as it surely will have to be in the future. The creodont group is reduced principally by transferring the miacids to the fissipeds. The condylarths receive new treatment. Small sections are added to the Sirenia and the desmostylids. There are many changes in the classification of the rodents, now grouped into three main suborders, and the lagomorph section is also revised.

Extensive changes appear in the arrangement and comprehensive listing of genera in the table of classification (pp. 346-96). Illustrations added to this edition are distinguished by their clarity, in some slight contrast to more smudged ones repeated from earlier editions. Certainly the entire work effectively serves a great need for a comprehensive vertebrate text that is clearly written, excellently illustrated, and salted with interesting and original ideas.

C. L. CAMP

9 Poco Paseo, Orinda, California

Biotoxichology

Poisonous and Venomous Marine Animals of the World. Vol. 1, Invertebrates. BRUCE W. HALSTEAD, with sections on chemistry by DONOVAN A. COURVILLE. Government Printing Office, Washington, D.C., 1965. 1030 pp., illus. \$50 for the set of three volumes.

This amazingly complete compilation of information relative to what might be called "dangerous" invertebrates is the culmination of some 20 years of work. It is a definitive monograph that will probably remain unrivaled for some time to come.

The volume begins with a historical account, which traces the recognition of poisonous marine invertebrates and the treatment of their effects from the time of ancient Egypt to the present. The eight most common marine invertebrate groups are then dealt with (Protozoa, Porifera, Coelenterata, Echinodermata, Mollusca, Platyhelminthes, Annelida, and Arthropoda). (It is because of the broad scope of this work that five reviewers, each a specialist in one of these groups, has participated in this review of it.) Each treatment begins with a taxonomically arranged listing of those animals reported as toxic or venomous, with

notes on distribution and with literature citations. Then a general account is given of biotoxichological research on the group, comments on the biology of the animals, and a morphological description of the poison glands, venom apparatus, or mechanism of intoxication, as applicable. There follow discussions of the medical and public-health aspects of the effects of the animal and consideration of toxicological assay methods and chemical analyses for the various toxins.

In almost all extensive undertakings such as this, it is inevitable that a number of minor errors survive editing procedures. Here, there are some occasional misspellings, and the captions for a few plates are reversed. In the chapter on the Mollusca there are errors in some ordinal and subclass names. The overall quality of the editing is high, however.

The treatment of all groups but the sponges is uniformly good. It is felt that there is an overemphasis on the commercial species and a relative neglect of the remaining sponges; this may well be a reflection of the amount of research that has been done on the two categories.

The book is well illustrated. The first chapter, on history, contains 175 figures, most of which are photographs of workers in the field of biotoxichology. There are about 20 line drawings and over 200 plates which serve to cover the animal groups. About half of the plates are in color; although they are well done from the standpoint of color, a number are not quite in focus, and there appears to be some repetition and superfluity. Those plates which are reproductions of illustrations from older scientific papers are of questionable value, since they are often so generalized that little detail is apparent.

In summary, it is felt that Halstead has done a great service in overseeing the drawing together of a vast amount of information on biotoxichology. It is to be hoped that, in addition to being a valuable source of specific information, the book will act as a stimulus for intensified research in this relatively neglected field.

MEREDITH L. JONES
RAYMOND B. MANNING
DAVID L. PAWSON
JOSEPH ROSEWATER
KLAUS RÜTZLER

*Museum of Natural History,
Smithsonian Institution,
Washington, D.C.*

Asiatic Plants

The Flora of Eastern Himalaya. Results of the Botanical Expedition to Eastern Himalaya organized by the University of Tokyo, 1960 and 1963. Compiled by HIROSHI HARA. University of Tokyo, Tokyo, 1966. 754 pp., illus. About \$32.

This handsome volume is at once a comprehensive illustrated catalogue of the temperate flora of Eastern Himalaya and a fascinating comparison of this flora with that of Japan. As is explained in the preface, "The main objects of [the University of Tokyo] Expeditions are to make clear the close botanical relationship between Eastern Himalaya and Japan, to investigate critically the corresponding taxa in both regions, and to analyse the process of evolution in the plant groups originated from a common ancestor in the Early Tertiary and now widely separated in both regions."

The larger part of the book is occupied by an enumeration of the taxa represented in the 60,000 specimens obtained by the two expeditions. For each taxon there is provided a synonymy, a list of collections, its distribution, and often taxonomic or ecological notes. Hara, who seems much too modestly designated as "compiler," has contributed accounts of some 90 families; a much smaller number, representing a broad spectrum, have been contributed by other Japanese botanists.

The groups included range from fungi and lichens through spermatophytes. There is a 12-page account of the membership of the expeditions and their itineraries, supplemented by a folded map at the end of the volume. All of this must constitute a major contribution to our knowledge of one of the world's most exotic floras, one that seems as remote as the dazzling picture of the distant Kangchenjunga Range in the frontispiece.

But to the reader who is not primarily concerned with this flora in its own right, the most interesting parts of the whole account will doubtless be the chapter by Hiroo Kanai on the phytogeography of Eastern Himalaya and its relationship to that of Japan, the taxonomic comparison between the same or vicarious species in the two areas by Hara, and the tantalizingly bare beginnings of a cytological comparison of these plants by Sachiko Kurosawa. Kanai gives a lengthy list of "Japono-Himalayan related plants,"