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 lighthearted 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.

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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 synonomy 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.