

latter point of neglected research the editor in his preface states, "One of the more interesting things that impressed the contributors to this volume is the many and large gaps that still remain in our knowledge of amphibian physiology. Far from closing the field with these chapters, therefore, we hope to have shown how really open it still is."

As the Canadian Field-Naturalist is intended for a broad audience interested in science and nature it would seem appropriate in this review to mention an unfortunate situation that bears directly upon amphibian physiological research, namely, rarely can physiologists, anatomists or embryologists be considered herpetologists or taxonomists. Thus, a physiological enquiry conducted upon a frog is often reported as *the* frog. If the experiment is repeated in another geographic area contradictory or inexplicable results are often obtained. No herpetologist would be surprised at this for he knows that there are many frogs and salamanders of different genetic constitution and that they are adapted physiologically to various habitats. However, although the physiologists may not fully appreciate the diversity in natural populations from different areas, a field biologist may in his turn not fully appreciate the contribution of the physiologist to the understanding of natural populations. A perusal of the chapters on Blood and Respiration, Water Balance and Kidney, and Metamorphosis should make any taxonomist realize that the morphological and morphometric characteristics which distinguish his habitat-specific forms are rough yardsticks compared to the delicate measurements of blood chemistry and muscle physiology which are the basic adaptive features that make it possible for a species to occupy a specific niche. The increased use of electrophoretic analysis in population studies is an encouraging sign of combined field and laboratory techniques.

Dr. J. A. Moore did much to promote the adoption of laboratory techniques of

experimental physiology through his own work in determining the temperature tolerance limits and growth rates of eggs of North American ranids and relating this data to field observations. In editing this present volume he has made another major contribution through having a vast array of scattered literature brought together in one book for the benefit of all biologists.

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Fishes of the Western North Atlantic

By H. B. BIGELOW, D. M. COHEN, M. M. DICK, R. H. GIBBS, JR., M. GREY, J. E. MORROW, JR., L. P. SCHULTZ and V. WALTERS. Memoir of the Sears Foundation for Marine Research, Number 1, Part 4. 1964. 599 pp. 155 fig. 2 maps. \$27.50.

This volume, the fourth in the series, covers the little known oceanic groups Argentinoidea, Stomiatoidea, Bathylacnoidea and Giganturoidei, as well as those freshwater Esocoidea (endings *sic*, see below) which sometimes enter brackish water. In the former fishes may be found remarkable adaptations to the conditions of deeper waters such as photophores (light producing organs) with lens and reflector, ultra-sensitive tubular eyes, enormous jaws whose length exceeds the length of the rest of the head, luminous-tipped lures of bizarre shape, long chin barbels up to eight times the length of the body.

Some of the fishes are handsomely depicted, e.g. the tubular-eyed *Opisthoproctus grimaldii* (fig. 19) by Mildred Carrington and the skulls of giganturid fishes (fig. 153) by Samuel B. McDowell, Jr. a few illustrations have been published previously and some are substandard. Unfortunately some of the species are not illustrated.

One of the great virtues of this series has been its cosmopolitan approach, despite its titular restriction to the western North Atlantic. Taxa may be keyed to

genera and sometimes species even when they may be extralimital. These volumes will be valuable to workers in other parts of the world.

The survey of pertinent Canadian literature is generally less thorough than that of the American literature. For example, there is no note of the Canadian records of *Bathylagus euryops* (published as *benedicti*), of *Borostomias*, of *Malacosteus niger*, nor of *Idiacanthus fasciola*, although the references reporting these records were repeated in the *List of the marine fishes of Canada* (McAllister, 1960, National Museum of Canada Bulletin 168). Another criticism is that certain authors have not included in their study material as great or as geographically broad a representation of specimens of certain species (in which adequate material is extant) as is requisite for good species descriptions. It is a shame to write a monograph of this size and not go to a little extra trouble to examine adequate material and produce the best illustrations. It is unfortunate that Dr. E. J. Crossman who is monographing the Esocoidei was not asked to co-author or author this group. It may be noted that suprafamilial endings, -oidea, are incorrectly used for orders.

The section on the Order Giganturoidei by V. Walters is particularly valuable because of the anatomical descriptions. The clear and error free writing which graces this volume is a tribute to the authors, and to the editor's vigilance.

Because of the small size of the edition (1500 copies), libraries and interested individuals would be wise to obtain copies soon. Because of its great value in encompassing so much literature and so broad a geographical area the edition will probably be exhausted early, despite the high cost per volume. In the event that the edition is exhausted, the Sears Foundation might consider the possibility of reprinting it in a quality paper back binding.

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Orchids of the Western Great Lakes Region

By FREDERICK W. CASE JR. The Cranbrook Institute of Science, Bloomfield Hills, Michigan. 1964. xii + 147 pp., 8 double colour plates and frontispiece, 24 black and white plates (many double), 52 half-page distribution maps (pp. 111-137) with key map identifying counties by name. \$7.00 (U.S.).

Mr. Case is a graduate botanist, with a master's degree from the University of Michigan, who teaches biology and natural science in Saginaw, Michigan. His students are very fortunate indeed, since in addition to being a botanist and teacher, he is an eager and enthusiastic naturalist with a wide field of interest and the ability to fire others with his enthusiasm.

This new book on the orchids of a specific region is a very valuable contribution to the literature, and an essential aid for the amateur field botanist. For residents of Ontario and southwestern Quebec it is a highly recommended purchase. Orchid hunters in these regions have been forced to refer to the very rare copies of Morris and Eames, *Our Wild Orchids*, which has been out of print for 25 years, or to use Correll, *Native Orchids of North America North of Mexico*, a magnificent book, but essentially taxonomic and therefore difficult for beginners. The other reference works freely available, Gray's Manual and Britton and Brown's Flora, are hardly field books, and while useful, though difficult, for the amateur, provide an absolute minimum of information.

Mr. Case's book includes an extensive introduction which should whet the appetite of any interested reader, and there is a long bibliography to help satisfy this appetite. After a brief introduction to the orchid family, with a description of the structure of orchid flowers and the evolution of orchids and their pollination, the author presents a chapter on orchid ecology which is the finest short introduction to the subject which this re-



McAllister, Don E. 1965. "Fishes of the Western North Atlantic, by H. B. Bigelow et al. [Review]." *The Canadian field-naturalist* 79(2), 148–149.
<https://doi.org/10.5962/p.342400>.

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