

From the scientific point of view, the statements in the book are completely undocumented: e.g., on page 27 at the beginning of the first complete paragraph, there is a statement "some biologists think." My immediate reaction to this type of statement is, why are the biologists not named, and a reference cited. If some particular fact interests a person, there are no leads given to other literature and the only possible references that one might check are those mentioned under the acknowledgments on page 124. I find this complete lack of reference to other literature a decided fault, since any interested reader might like to check other references. Otherwise there is little to criticize. There are some vague statements and a few mistakes: i.e., the number of surviving bison differs on pages 57 and 59 although the statements supposedly refer to the same statistic.

The format of the book in many ways reflects the author's background. She has a B.Sc. in Zoology from Nottingham University and has subsequently lectured to children and students and served as an editor of an encyclopedia of animal life. Generally, statements in encyclopedias are often not documented, and in many ways the current book is written along encyclopedic lines but is more lavishly illustrated. It can be recommended as a general compendium on the subject but is somewhat lacking in depth so that it would not be of particular interest to a person knowledgeable on the subject of animal migration.

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Pacific Fishes of Canada

By J. L. Hart. 1973. Fisheries Research Board of Canada Bulletin 180. 740 pp., numerous illustrations, eight color plates. Information Canada, Ottawa K1A 0S9. \$8.

This volume is not a mere updating of the well-known *Fishes of the Pacific Coast of Canada* by Clemens and Wilby. It is, in essence, a completely new book well illustrated with new drawings as well as sketches of diagnostic features. The 325 species of marine fishes known to occur in British Columbia are described and figured. Superb color photos of live fishes, taken by F. T. Pletcher, embellish the volume. Several additional species were recorded from B.C. after the manuscript was well advanced, and are mentioned in various keys but not in the species accounts (e.g., *Xenomystax atrarius*, *Acantholiparis opercularis*, *Xeneretmus leiops*).

The brief introductory section includes a concise history of pertinent Pacific ichthyology which is complemented by a succinct summary of North Pacific oceanography. Sections on "Scope of Coverage," and explanations of "Species Accounts," "Keys," and "Classification" complete the introduction.

The species accounts begin with a key to classes or subclasses; subsequent keys in these major sections lead either to species (Elasmobranchii) or to families (Osteichthyes). The familial

key in Osteichthyes is quite workable and not excessively long (e.g., only 20 steps to Sciaenidae at couplet 84). Only occasionally is the key vague (e.g., couplet 64, "Fishes with one spine" would better read "Fishes with one dorsal spine"). Keys to species within familial groups (which we have tried) are clear and workable.

Each species account includes the derivation of the scientific name, a description (diagnosis, meristics, color, size), recognition (features for rapid recognition, which would be better placed at the beginning), and where known or pertinent, sections on life history and utilization. In some species (salmonids, clupeids, osmerids) these latter sections are extensive. Both world (unlike previous editions) and British Columbian distributions are given. An unusual but efficient combination of "numbering and authoring" is used for references. It is noteworthy that more than 1100 references (through 1970) are cited, attesting the exhaustive literature review. Species accounts are thorough, and with some notable exceptions, the illustrations are very good. The drawings of *Notolepis rissoi* and *Bathylagus milleri* give the misleading impression that scales are wanting, while that of *Argyropelecus lychnus* lacks the precise definition and high quality of *Macropinna microstoma*. The drawings of Pacific bonito and dusky rockfish are somewhat tipsy in their orientation.

Two inclusions that should be, but seldom are, standard for works of this nature are a gazeteer of the area under consideration and a list of the specimens used for illustration.

A short but generally adequate glossary of relevant ichthyological and anatomical terms is included. "Trifid" should be a separate entry and not placed under "bifid" and the definitions for shoulder girdle and placoid are poor.

The Fisheries Research Board of Canada deserves congratulations for having produced a most useful reference and guide to the richest of

Canada's fish faunas. This book, which was Dr. Hart's last major project, stands as a tribute to the memory of a man who had spent a distinguished career in biology.

The first printing of 4100 copies is now almost sold out and a second printing is underway.

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BOTANY

Research Experiences in Plant Physiology. A laboratory manual

By Thomas C. Moore. 1974. Springer-Verlag, New York. 462 pp. \$9.50.

Thomas Moore's *Research Experiences in Plant Physiology* is a well-tested laboratory manual developed over a 12-year period by a teacher of plant physiology. As with many laboratory manuals, this one reflects a specific course and the author's personal approach to the subject. Moore presents 25 exercises, half of which emphasize plant growth and development, with the others devoted to photosynthesis, mineral nutrition, protein chemistry, and membranes. Although the manual is aimed at upper division undergraduate and graduate students, about half of the exercises could well be executed by sophomores, even in large classes; the remainder, which include protein electrophoresis and incorporation of radioisotopes, are definitely suited to small groups of advanced students.

Since courses in plant physiology often differ widely between and within universities in terms of the types of students to be taught, duration, topics, and personal style, this worthwhile manual may have restricted application. Recognizing this situation, Moore has purposefully set forth his manual in a rarely seen format which allows the ready utilization of any set of specific exercises and expeditious revision of the manual itself. Specifically, each exercise is complete in itself and is written in five sections. The "Introduction" gives the intended purpose and a rationale, context

and perspective for the prescribed experiment or procedure. The "Materials and Methods" section gives the actual prescribed procedure in detail, alerts the student to critical points and instructs on the handling of the data. The third section is a list of references which is rather extensive and thus beneficial to students who happen to be particularly interested in that area of investigation. Next is a section on the required special reagents, supplies and equipment, and notes on scheduling. Moore has very helpfully included the sources (with complete addresses) for many of the special items. He also notes very realistically the laboratory time which a student must devote to the exercise. The concluding section is a set of report forms containing directive tables and graphs, as well as summarizing questions.

Moore intends the exercises to be *research experiences* for the students. The sometimes complex procedures and the analyses and interpretations required certainly tend toward this goal. I would suggest that the exercises are, however, just that, well-tested exercises with infrequent failures guaranteed when appropriate care and preparation are ensured.

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