

because they are also keys to all that has been learned.

With this volume, long awaited by dragonfly enthusiasts, the monograph on the Odonata of Canada and Alaska is now complete — or would be if volumes one and two were not temporarily out of print. These volumes are scheduled for reprinting, I understand, but unfortunately at a much higher price. Volume one, published in 1953, included, as well as the introduction, the Zygoptera or damselflies, and volume two, published in 1958, included four families of the Anisoptera or dragonflies: the Aeshnidae or darners; the Petaluridae or graybacks; the Gomphidae or clubtails; and the Cordulegastridae or biddies. This final volume covers the superfamily Libelluloidea, including the Macromiidae or belted skimmers, the Corduliidae or green-eyed skimmers, and the Libellulidae or common skimmers. As the name suggests, this latter group includes our most common dragonflies, with 11 genera and 44 species occurring in Canada. A total of 20 genera and 76 species of dragonflies is included in this volume.

Volume three continues in the same excellent style set by Professor E. M. Walker in the first two

volumes. There are keys, for both adults and nymphs, to the families of Libelluloidea, to the genera and to the species. In conjunction with the excellent illustrations, I have found the keys easy to use. Each species account is of at least one page, usually two to three pages, and includes a synonymy, a general description, a detailed description of each sex and the nymph, habitat and range, and the distribution in Canada. Detailed field notes, discussing such aspects of dragonfly biology as flight period and behavior, contribute significantly to the text.

This is a book I would recommend to anyone interested in dragonflies or in aquatic biology. The only complaint I have with this volume is the high price, which will tend to put it beyond the reach of many would-be dragonfly enthusiasts, especially considering the price of the entire set of three volumes.

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## Opération coelacanth

By Jean Anthony. 1976. Vivre et revivre l'aventure 7. Collection edited by Anne and Jacques Arthaud. Librairie Arthaud, Paris. 201 pp., illus.

The coelacanth is one of the creatures which has caught and kept the imagination of the public, a fish of a group older than the dinosaurs but which survived them, long thought to be extinct but now known still to survive off Africa. Hence it is called a living fossil. We are fortunate to have this account by one of the two men who know it best and who have changed it from one whose anatomy was almost unknown to one whose anatomy is among the best known, Jean Anthony.

The first chapter gives the history of the coelacanth, describes the discovery of the tiny brain, the fat-invested swim bladder, the curiously placed kidney, the mysterious rostral organ, on the first French specimen, as well as telling something of the evolutionary significance of the enigmatic species, *Latimeria chalumnae*.

Subsequent chapters spin the story of an expedition to the Comores Archipelago in search of a freshly caught or if possible a living specimen. This joint international expedition by the Muséum national d'Histoire naturelle of Paris, The Royal Society of London, and the National Academy of Sciences of United States took three years to plan and three months to carry out. From the high-quality impres-

sions of the French coelacanth monographs one was led to believe that good financial support for the project was provided. One is therefore surprised to learn that difficulty was found in obtaining funds from the French government; a boat and vehicle had to be obtained from local sources. The biggest problem was securing authority from the labyrinthine government administration in the time available, almost making the actual expedition itself seem simple.

The international coelacanth committee solicited requests from scientists for fresh anatomical samples for research projects so that the fullest use would be made of any specimen caught. Resulting requests included 30 kg (66 lb) of muscle from one scientist, half a dozen eyes and hearts from several others, brain and other tissues, each accompanied by particular methods of preservation. Plans were made on how to satisfy all these requests and a schedule for the participants to share the work in the Comores.

The last half of the book is devoted to the expedition itself. Five days after arrival in Moroni, Grande Comore Island, a telephone call announced the capture of a live coelacanth on the neighboring island. Samples from it and a second specimen caught

in the last days of the expedition were dispersed to fifty laboratories around the world. Subsequent findings greatly advanced our knowledge of this fish.

In the final pages of this book we learn that the coelacanth is a live-bearer, giving birth to young about a foot long. As background we learn of these perfumed islands, the land and seascape, the market place and the fishermen. The style is colorful and spiced with touches of humor. There are a few miniscule errors; species names, for example, are usually capitalized. The illustration of internal organs bears no indication of which end is anterior, which will confuse the average reader. A colorful cover and color plates in the text of "old fourlegs," scales, eggs, the brave fishermen who venture a kilometre offshore

in tiny dugouts to capture this vigorous fish, and a mysterious antique silver model of the coelacanth of unknown origin, embellish the book.

The book is well-written, informative, and enjoyable to read. It is recommended to anyone interested in biology. Congratulations are offered to Anthony for this semi-popularization. It may be mentioned as a footnote that the manuscript of the third and final monograph on the coelacanth has been submitted for publication.

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## BOTANY

### Biology of Plants

By Peter H. Raven, Ray F. Evert, and Helena Curtis.  
1976. 2nd edition. Worth, New York. 685 pp. \$15.95.

This is an excellent introductory college text, noticeably strengthened in comparison with the first edition (by Raven and Curtis). The 29 chapters are democratically divided among all of the major sub-disciplines of botany, with due attention to biochemistry, cytology, physiology, genetics, evolution, anatomy, ecology, physiology, biogeography, and the morphology and taxonomy of major groups. The inclusion of topics is comprehensive, whereas the exposition of each subject is sufficiently limited and simplistic that an undergraduate student should not be overwhelmed. The style is informal and lucid.

The authors adopt R. H. Whittaker's five-kingdom scheme of living things, classifying the blue-green algae and the bacteria in the Monera, and the remaining algae, the slime molds, and the protozoans in the Protista, leaving the Fungi, the Animalia, and the Plantae. The Plantae include only the bryophytes and the higher plants. Obviously this modern narrow circumscription of the plant kingdom is out of step with the usual segregation of biology departments into botany and zoology divisions. Pragmatically, the authors treat all groups traditionally considered to be plants, leaving the Animalia and the protozoans for the zoologists.

The book is exceptionally up to date, reporting many new findings and developments. This is an important consideration for an instructor choosing a text because recent discoveries (for examples, in

relation to plate tectonics, the modes of photosynthesis, and the origin of mitochondria and chloroplasts) have dated many books currently in use as texts. Although remarkably topical, the book also provides excellent historical perspectives of developments in botany.

The book is very accurate and quite well structured pedagogically. A standard format for reproductive cycles of different plant groups simplifies comprehension. Numerous diagrams and photographs are present, most of them clarifying the text. Many of the color photographs are superb. But the photograph showing that "the Indian pipe, *Monotropa* entirely lacks chlorophyll" has obviously been color distorted since the plant shown is quite green (p. 343). Included in the very few minor errors I could detect was the reference to water hemlock (*Cicuta*) as *Daucus carota* (p. 346), and to calactin as an alkaloid (p. 385).

*Biology of Plants* deserves to be considered for use in introductory courses in botany. As well, it can be recommended to those without any formal scientific background who wish a very readable accounting of the many fascinating discoveries of the diverse fields within botany.

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