

The standard authority in the field of lichen study published in this country is this book finally republished. Since the author's death, certain changes have been made in conformance to his own intended changes in the book as well as a few others.

The introductory chapters are complete ones on the structure and life histories of lichens. The plates are clear and distinct. The major section of the book is a history of the species, carefully annotated and described. It is too bad that the black and white illustrations and accompanying line drawings are together in the back of the book. Color reproductions would have been most helpful to the amateur student of the lichens. This group is a ubiquitous one yet seldom studied in any detail in elementary courses—a fate which is not warranted. This is a book which is seldom found in the biology library, but it certainly belongs there.

LICHEN HANDBOOK, Mason E. Hale, Jr., 178 pp., \$4.00, Smithsonian Institute, Washington, D. C., 1961.

It is difficult to imagine a biology library, whatever its level, being without this book. As the author points out, lichenology has been a neglected subject, even among amateurs. But its potential is quite extensive.

This is more than an identification handbook, although that is there, including an errata sheet for Fink's well-known work. In fact, for identification both books must be used. The chapter titles in this book will give one its scope: Morphology and Anatomy, Reproduction, Physiology and Growth, Symbiosis, Chemistry, Lichen Acids, Chemical Strains, Economic Uses, and Phytogeography. The reviewer knows of no other work where all this is incorporated into one book. The chapters on Chemistry, Symbiosis, and Physiology and Growth are particularly stimulating—especially for the teacher looking for teaching aids to enrich his lab and class work for student project ideas. Highly recommended.

ELECTROLYTES AND PLANT CELLS in *Botanical Monographs*, G. E. Briggs, A. B. Hope, and R. N. Robertson, Eds., 217 pp., \$8.00, Blackwell Scientific Publications, Oxford, 1961.

Volume one of the *Botanical Monographs* promises well for the rest of the series. The authors present an authoritative treatment of an area which has needed unification. Such individual topics as the Donnan equilibrium, the free-space concept, membrane structure, and ion accumulation have been dealt with previously and rather frequently, but not recently, and seldom with such a clear concept of the interrelations of the various subtopics. While

the authors take cognizance of the more recent knowledge of submicroscopic structure of cells, they miss an opportunity to link this morphological information with the newer functional concepts. This is perhaps the greatest weakness in the book.

Much of the text requires a mathematical sophistication which will place the material beyond the high school student, but it should be useful for his teacher and indispensable as a reference for specialists in plant or cellular physiology.

Charles W. Hagen, Jr.
Department of Botany
Indiana University

A MONOGRAPH OF THE WORLD SPECIES OF HYPOXYLON, Julian Miller, Ed., 158 pp., \$6.50, University of Georgia Press, Athens, Georgia, 1961.

The culmination of more than thirty years of research by the author, this monograph will be the standard taxonomic reference to *Hypoxylon* for many years to come. It will be invaluable to students of the stromatic Pyrenomycetes, but its rather specialized nature makes it of rather limited value in secondary school science programs.

Robert M. Johns
Department of Botany
Indiana University

Zoology

COMPARATIVE ANIMAL PHYSIOLOGY, Second Edition, C. Ladd Prosser and Frank A. Brown, Jr., 688 pp., \$15.50, W. B. Saunders Company, Philadelphia, 1961.

All teachers of biology should have ready access to this book as a source of sound information concerning physiological problems. Its scope is greater than the title suggests since it not only concerns itself with animals of all phyla but considers adaptive and ecological aspects. It would be possible to extract from its pages a modest book on biochemistry and another on animal adaptation; that is, it is simultaneously mechanistic and teleological.

This new edition is thoroughly rewritten, not merely patched up. For example the echolocation sounds of bats were described in the 1950 edition; now we have records obtained from electrodes placed on the auditory nerves of moths preyed on by bats and these are fair imitations of the bats' moth-locating cry! The role of the counter-current principle in the interpretation of mammalian kidney function is new since the earlier edition. The discussion of ameoboid movement brings into focus new experiments and interpretations (e. g., Goldacre

and Lorch, Allen). The question as to how to get useful water from the sea has been solved by marine birds by the use of nasal salt-secreting glands. These random samples are given to indicate that the book is a mine of information and is up to date.

Comparative Physiology is not recommended as light reading nor is it enlivened by anecdotes, puns, innuendos, double-entendres, nor colored pictures. As claimed by the publisher's flier it is "information-crammed." On the shelf of a high school library it is to be regarded as an invaluable reference book for the biology teacher and the gifted student.

Sears Crowell
Department of Zoology
Indiana University

THE MERCK VETERINARY MANUAL, 2nd Ed., O. H. Siegmund, Ed., ix + 1624 p., \$9.75, Merck and Co., Rahway, New York, 1961.

Here is a book that belongs in every laboratory that maintains an animal colony. It also has potential users outside of veterinary medicine in fields such as parasitology, physiology, nutrition, and wildlife management.

The first three-quarters of the book, devoted to the diseases of large and small animals, is divided into sixteen sections each dealing, for example, with subjects such as allergy, digestive system, endocrine system, neoplasms, nutrition, parasitic diseases, etc. The second part deals with the toxicology of pesticides and other natural and artificial poisons. Other major divisions deal with poultry; fur, laboratory, and zoo animals; therapeutic procedures and laboratory examinations; and prescriptions. The book is thumb-indexed by sections, and there is a good comprehensive index.

John M. Hamilton
Park College
Parkville, Missouri

ECOLOGY AND DISTRIBUTION OF RECENT FORAMINIFERA, Fred B. Phleger, viii + 297 p., \$7.50, John Hopkins Press, Baltimore, 1960.

The Foraminifera are an important group of Protozoa that occur, for the most part, in marine or brackish environments. A few are found in fresh water. All have shells or skeletons of some sort. These shells have been preserved as fossils in geologic formations since Cambrian time. Because of their importance to the petroleum industry in locating oil deposits, fossil Foraminifera have been widely studied.

Phleger has brought together in this book the existing information concerning the ecology and distribution of the Foraminifera in the hope that present knowledge and future discoveries will make it possible to determine

the climatic and other conditions at the time the fossil deposits were laid down. There is a discussion of benthonic and planktonic populations under a wide variety of conditions. Many tables and charts show the distribution of species in these environments.

This book is certain to be useful to oceanographers and petroleum geologists. Teachers in schools in coastal areas and in regions where petroleum production is an important industry should have it as a reference for their students.

John M. Hamilton
Park College
Parkville, Missouri

HOW TO COLLECT SHELLS (A SYMPOSIUM), 2nd Ed., iv + 92 p., \$2.00, American Malacological Union, Route 2, Box 318, Marinette, Wisconsin, 1961.

This paper bound booklet brings together a large number of short articles by many authors. Many were written for the first edition in 1941, and others are reprints of articles from a variety of sources. They are grouped in this book in three sections: "Collecting Marine Shells," "Collecting Nonmarine Shells," and "Arrangement and Study of Shell Collections." The articles vary in length and quality, and this reviewer feels that the book needed a hard-boiled editor who would have given the text more uniformity and who would have directed it more to the needs of the beginner. There is a lot of information here about molluscs, for one cannot discuss collecting shells without considering the natural history of the animals that make them. The articles are interesting, and undoubtedly a beginner or an advanced collector will learn something about shell collecting from this book.

John M. Hamilton
Park College
Parkville, Missouri

SEX RATIOS AND AGE RATIOS IN NORTH AMERICAN DUCKS, Frank C. Bellrose, Thomas G. Scott, Arthur S. Hawkins, and Jessop B. Low, Illinois Natural History Survey Bulletin, Vol. 27, Article 6, pp. 391-474, \$1.00, Illinois Natural History Survey, Urbana, Illinois, 1961.

This study is an evaluation of sex and age ratios in North American duck populations. It also presents a discussion of waterfowl management and the way these ratios can be used to measure productivity. This monographic work is the result of over twenty years of research in the field and is extensively documented and illustrated. A large amount of information is included on waterfowl production and hunting, environmental relationships, breeding, and fly-