

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