

recommend this book to them. But I think most researchers would prefer to read these articles in the journals and then to reproduce those of special interest. In later years, would it not be easier to find these papers in the journals rather than in this volume? A much more valuable volume would be one that contained the 32 most informative contributions made to boron-nitrogen chemistry during the last 5 years, or a review and evaluation of boron-nitrogen chemistry. Some of the most informative contributions in boron-nitrogen chemistry were made by those who contributed to this volume, but these more valuable works were published in the journals, not in books.

In 1959, volume 23 of the *Advances in Chemistry Series, Metal-Organic Compounds*, was published. Volume 23, like volume 42, was the result of a symposium. The big difference in the two volumes lies in the fact that many of the papers in volume 23 are very broad review articles (for example, metal alkoxides by D. C. Bradley, organolithium compounds by Don Esmay, Grignard reagents by T. D. Waugh and R. C. Waugh, organoboron compounds by R. M. Adams, and organoaluminum compounds by R. F. Schultz) and therefore very desirable in a bound volume. The contributions in *Boron-Nitrogen Chemistry* are much more concerned with discussions of very specific problems, and their logical place is in the journals.

I feel that, although this volume will be of some value to those actively working in the area of boron-nitrogen chemistry, books of this type are not necessary and that the publication of such papers in this form should be discouraged.

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Botany

The Structure and Life of Bryophytes.

E. V. Watson. Hillary House, New York, 1964. 192 pp. Illus. \$3.

This small book is one of a series in biology issued by the Hutchinson University Library, London. Approximately three-fourths of the contents present a highly readable and more or less straightforward account of the morphology of mosses and liverworts.

The remainder recounts very sketchily and not always representatively some of the results of recent and contemporary research on bryophytes in such areas as physiology, ecology, cytology, genetics, geographical distribution, and speciation. The author does not pretend that his coverage has the depth and detail found in such standard texts as those of Parihar and of Smith. It is Watson's hope, rather, that "... it will enable the university student to see morphological facts from a new angle and at the same time have his interest directed to other branches of bryophyte study."

The first chapter contains an introduction that provides sufficient background information, including the basic terminology, to allow even the rank novice to read the book with understanding. After a short and perhaps too condensed discussion of classification, the next seven chapters (119 of the 170 pages of text) are devoted to morphology; this includes discussion of the gametophytes and sporophytes of both mosses and liverworts, as well as separate chapters on asexual and sexual reproduction. The remaining one-fourth of the book is devoted to morphogenesis, anatomy, and physiology (one chapter), ecology (one chapter), and geographical distribution, geological history, cytogenetics, and speciation (one chapter). The final chapter contains some concluding remarks which attempt to evaluate the present directions of bryological research. The book contains a selected bibliography of 267 entries, none of which is more recent than 1961.

Geographical distribution is probably the least adequately handled of all the subjects treated. The scant six pages devoted to it are drawn almost entirely from Herzog's classical *Geographie der Moose*, and the discussion is limited essentially to distributional patterns of Europe and South America. Cytogenetics is treated much too briefly, although the reader is referred to the excellent review by Lewis. Systematics and biosystematics are scarcely mentioned, and the recent studies of mosses, in which chromatographic techniques were utilized, are ignored. The fine structure studies of the chloroplasts of both mosses and hepatics might have been discussed.

Despite these shortcomings, which I am sure were imposed by considerations of length, this is an important book. It is competently assembled and very well written. The style is informal,

and the writing is unlabored. It is a stimulating book that can be recommended to all botanists, but especially to students who wish to gain more than an elementary knowledge of this unique group of plants. In my opinion, Watson has achieved his aim in writing the book.

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Nuclear Engineering

Effects of Radiation on Material and Components.

John F. Kircher and Richard E. Bowman, Eds. Reinhold, New York; Chapman and Hall, London, 1964. xii + 690 pp. Illus. \$22.50.

The title of this book is somewhat imprecise, because the book's scope is limited to the changes produced in the physical properties of matter by high energy and ionizing radiation commonly produced by nuclear reactors. The objective that the authors set out to accomplish—namely, to condense the accumulated data available in the information system of the Radiation Effects Information Center at the Batelle Memorial Institute into a book for the convenience of engineers involved in the design of equipment or structures for use in high energy radiation fields—has been admirably achieved. The book is well written and is perhaps as readable as such a condensation of data can be. Among the subjects covered with good perspicuity are polymers, fuels, lubricants, organic compounds, ceramics, metals, alloys, semiconductor devices, and electronic components.

The majority of the references are to reports based on work carried out on government-sponsored programs. These documents presumably have not been subjected to the screening and review given to articles that are published in the formal literature. Thus, with all due respect to the perspicacity of the authors, one is inclined to have some reservations about the value of the data. Perhaps, the thing made most abundantly clear by this compendium is that a wide gulf exists in this field between science, or what is normally called science, and engineering. The fault lies with neither the scientist nor the engineer but rather with those who force applied developments without

fostering the growth of basic science. The field of high energy radiation-induced processes in matter is an extremely difficult one owing to the complexity and heterogeneity of the phenomena. Much more work must be done on the fundamentals in this field before comprehensive theories capable of quantitatively correlating data are developed.

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Physiology

Animal Body Fluids and Their Regulations. A. P. M. Lockwood. Harvard University Press, Cambridge, Mass., 1964. 185 pp. Illus. \$2.75.

The author of this book was formerly at Cambridge University and is now lecturer in zoology at the University of Southampton. He is well known for his work in the osmotic regulation of crustaceans and has previously shown his ability to write excellent and clear reviews. It was therefore with considerable anticipation that I opened this little book, which was written for a level equivalent to that of the beginning college student in the United States.

The book follows an attractive and clear outline. It progresses from the regulation of invertebrate body fluids through vertebrate body fluids, blood, cell composition, active uptake, and the role of the kidney, to a final chapter on the regulation of body water and ion content. It ends with a convenient synoptic table of physiological salines for a variety of invertebrates and vertebrates, which, commendably, cites the "author" of each fluid, but, alas, the list of references reveals no trace of these authors.

Despite his clear outline, Lockwood has not succeeded in the difficult task of extending clarity of presentation to the level of the text. This may be a case where a competent scientist, writing at a more elementary level than that to which he is accustomed, is unable to communicate the fundamental simplicity of the underlying principles with which he is so familiar. Furthermore, the book contains not only misprints but numerous errors of fact, misstatements, and unclear passages; it includes definitions in some places but omits more necessary explanations else-

where, unit designations are not uniform and are sometimes lacking, metric units are incorrectly designated, and so on.

None of the eight chapters in the book is conspicuously better or worse than the others. Thus, Lockwood has not failed especially in those areas that are further from his own research interests. On the contrary, throughout the book there is evidence that he is familiar with a broad body of knowledge in the field of osmotic regulation in living organisms, and it is unfortunate that he has not succeeded better in making it available to the untrained reader.

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Antarctic Biology

Biologie Antarctique. Comptes-rendus, Premier Symposium organisé par le S.C.A.R. (Actualités Scientifiques et Industrielles, No. 1312). Robert Carrick, Martin Holdgate, and Jean Prévost, Eds. Hermann, Paris, 1964. 652 pp. Illus. F. 54.

This volume records the proceedings of a symposium organized by the Scientific Committee for Antarctic Research (SCAR), an international body subsidiary to the International Council of Scientific Unions (ICSU), which since 1960 has had a Permanent Working Group in Biology for the purpose of stimulating, planning, and coordinating biological research in Antarctica, including the subantarctic regions. The symposium was held in Paris, in September 1962, under the auspices of the Académie des Sciences and with the support of the International Union of Biological Sciences (IUBS).

Although it has long been widely realized that the Antarctic continent and adjacent seas and islands offer unique opportunities for studying the evolution of living organisms in the Southern Hemisphere and their physiological specialization to extremely hostile environmental conditions, the lack of adequate local facilities for such studies has until recently been the most serious limiting factor. The activities of the International Geophysical Year during 1957 and 1958 resulted in the establishment of a number of new scientific stations, many of which have been continuously main-

tained and offer good working conditions and laboratory accommodations for biological specialists. Conjointly with this improvement in the available facilities for field research there has come increased financial support of scientific research from the governments of the various countries operating stations on and adjacent to the Antarctic continent. This volume presents an impressive demonstration of the rapid progress thus made possible in all aspects of Antarctic biology during the last decade.

The contents consist of 57 papers, 45 in English and 12 in French, distributed in 13 sections: The Life Sciences in the Antarctic, Human Physiology and Psychology under Antarctic Conditions, Microbiology, Biogeography and Systematics-Botany, Biogeography and Systematics-Marine Zoology, Biogeography and Systematics-Terrestrial Zoology, Marine Productivity, Ecology of Invertebrates, Ecology of Vertebrates, Ethology of Vertebrates, Conservation, Animal Physiology, and Future Research Programs. Each section includes a verbatim transcript of the discussions that followed the various sessions; the symposium was attended by 100 biologists from 14 countries. The final paper, by J. E. Smith, sums up the proceedings of the symposium; Smith outlines the present achievements and future goals of such important aspects of Antarctic biological research as the food chains and primary productivity of the circumcontinental marine fauna and flora, their relationships to the hydrographic features of the Antarctic seas, and the systematics and ecology of the organisms inhabiting freshwater and terrestrial environments.

The book is well illustrated with 11 photographic plates that show field and laboratory techniques; plant and animal communities of marine, submarine, and terrestrial environments; Antarctic seals, birds, and insects in their natural habitats; the histology and parasitology of Antarctic animals; and commercial whaling operations. The printing and layout of text figures and tables is good, and there is a gratifying absence of the typographical errors that often mar bilingual productions of this kind. But the binding is far from satisfactory; spine and hinges of some brand new copies are already beginning to disintegrate.

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