Book Reviews

The International Dictionary of Physics and Electronics. Walter C. Michels, Senior Ed. Van Nostrand, Princeton, N.J.; Macmillan, London, 1956. 1004 pp. Illus. $20.

It would be of some interest to know who conceived the idea of a voluminous reference document containing definitions—some long, some short—of most of the specialized terms encountered today in the literature of physics and electronics. The originator of the project and all those who had a hand in preparing this extensive one-volume compendium of useful information deserve the thanks of the scientific community.

Compilations of definitions of physical terms have been published before, but a brief search has failed to reveal any volume comparable with the *International Dictionary of Physics and Electronics.* In this work, the editor and the contributors have attempted to provide a reference tool useful (as the preface puts it) to ". . . the greatest possible number of those people who are working with physics. This group includes not only professional physicists, and those intending to make physics their profession, but also the far greater number of workers in other fields who have frequent need for information about terms used in physics."

Among the definitions in this dictionary one finds a variety of treatments of terms related to laws, relationships, equations, basic principles, instruments, and apparatus. Where a brief definition suffices, it is used: "DEKAGRAM. Ten grams." On the other hand, the editor has not made a fetish of brevity; the "definition" of "RELATIVITY THEORY, SPECIAL" occupies a full page, and more than three pages are devoted to the term "TELEVISION."

Several hundred line drawings (including a number of circuit diagrams) add to the clarity and completeness of the volume. The aim of the volume's compilers was the inclusion of "both formal and discursive statements and entries" in most definitions. This policy has necessarily resulted in a lengthening of the book, but the consequent gain in utility will probably justify the decision to present the material in this way.

Walter Michels, as senior editor, was assisted by 14 contributing editors representative of various specialized fields. Four British scientists were included in this group. The *International Dictionary of Physics and Electronics* will undoubtedly make a well-deserved place for itself in a large number of laboratories and libraries.

BOWEN C. DEES
National Science Foundation

E. A. Birge, a Memoir. G. C. Sellery. With an appraisal of Birge the limnologist, *An Explorer of Lakes,* by C. H. Mortimer. University of Wisconsin Press, Madison, 1956. 221 pp. Illus. + plates. $3.50.

In these days of ultimate specialization, it is both refreshing and encouraging to read about a scientist whose long life (just short of a century) encompassed notable careers in biology and administration, both of which were further enriched by remarkable talents in philosophy and religion and as an essayist and lecturer. This portrait of the life and accomplishments of Edward Asahel Birge is written by G. C. Sellery, his long-time friend and colleague at the University of Wisconsin. Sellery has drawn upon rich source material and abundant anecdote for his memoir on the many-faceted Birge.

The book contains seven chapters. "The preparation" and "The professor" cover his early life, education, and teaching. Professors and administrators will find that Birge as "The lieutenant of presidents" and "The president" (of the University of Wisconsin) had to deal with university problems and internal politics which have shown no fundamental changes in America during the past half-century. He was largely responsible for the development of the present stature of the University of Wisconsin.

As "The lecturer and essayist," Birge exhibited a broad knowledge of classical literature; he also had the happy ability of being able to write and speak for a wide variety of audiences on topics ranging from a popular lecture on Darwinism, limnology, or "culture" to an appeal to the state legislature or a masterly funeral memorial to a deceased friend. "The religious man" reveals his knowledge of the Scriptures and his reconciliation of science, evolution, and religion. His series of 13 annual sermons on St. Paul were models. "Some final estimates" contains an unusual evaluation of an alternate side of Birge's personality —his brusqueness, aversion to "small talk," rare indignation, and early criticisms of applied science.

The final and longest section of the book, "An explorer of lakes," was written by the English limnologist C. H. Mortimer. It is a general account of limnology, with the major classical papers of Birge and his collaborators (especially C. Juday) in mind. His most notable publications dealt with Cladoceran biology, diurnal migrations of zooplankters, annual plankton cycles, food webs, light penetration into lakes, temperature conditions, dissolved gases, and other aspects of lake chemistry. Up to his death in 1950, this work paralleled the development of modern limnology. Indeed, it *was* the development of modern limnology. And most of these contributions were published when Birge had gone beyond middle age!

In short, this book is an unusually penetrating picture of a distinguished teacher, scholar, administrator, and scientist—a fellow in a "race of giants." It should interest limnologists, nonscientists, and university administrators; it should appeal to those who knew Birge only slightly as well as those who knew him well.

ROBERT W. PENNAK
Department of Biology, University of Colorado

Weather Analysis and Forecasting. vol. I, *Motion and Motion Systems.* Sverre Petterssen. McGraw-Hill, New York, ed. 2, 1956. 428 pp. Illus. $8.50.

Weather Analysis and Forecasting. vol. II, *Weather and Weather Systems.* Sverre Petterssen. McGraw-Hill, New York, ed. 2, 1956. 266 pp. Illus. $6.

The second edition of Petterssen's well-known textbook is really an entirely new book. The revisions have been so extensive that almost nothing remains of the original edition. The orientation, material, illustrations, and organization, as well as basic concepts, have been completely altered and modernized.

The changes in the book reflect the transformation that meteorology has undergone in the last 15 years. In 1940, when the first edition was published, weather forecasting was a highly personal and subjective art with virtually no quantitative methodology. The basic ideas of synoptic meteorology found in the

first edition were the air mass and frontal concepts of the Scandinavian school. Almost the only quantitative procedures were Petterssen's kinematic formulas, which were never very powerful tools.

The transformation of synoptic meteorology began (about the time the first edition was published) with Rossby's vigorous applications of dynamic meteorology to weather forecasting. The vorticity concept became a central idea of synoptic meteorology, culminating in Charney's development of numerical weather prediction, the computation of prognostic weather maps by means of high-speed computers. At the same time the expansion of networks of upper air observations during and after World War II eliminated the need for inference about the structure of weather systems, providing weather analysts with a tremendous body of new data which forced them to revise their ideas and techniques.

In addition to numerical weather prediction, the last 15 years have seen the development of other quantitative forecasting procedures of a statistical nature. Graphical and numerical techniques of forecasting have been developed. The latter have been facilitated by the use of electronic data-processing machines which make it possible to digest the mountain of meteorological data required to deduce statistically useful relationships.

The meteorological revolution has not yet reached weather forecasting at the "will it rain today?" level, and the public may question whether forecasts are better today than they were 15 years ago. But the impact of these technologic developments on the thinking of synoptic meteorologists is evident in Petterssen's new book. The distinction between dynamic (theoretical) and synoptic (applied) meteorology is being erased. Thus the author lays down a sufficient groundwork of dynamic meteorology in this book to justify its use as an introductory textbook in dynamic meteorology.

The book is published in two volumes. (I question the necessity for two volumes, which is both inconvenient and expensive.) The first volume is devoted to applied hydrodynamics and the prediction of pressure and wind systems. Applied thermodynamics and the prediction of weather is left to the second volume. In both volumes the treatment is thoroughly up to date, and the book abounds in examples and references from the last 5 years. The relatively small size of volume II and the brief portion of that volume devoted to *weather* forecasting (as opposed to pressure forecasting) is representative of the currently lopsided state of development of synoptic meteorology.

A few errors are found in the book. The European, rather than the American, definition of sleet has been retained in the new edition. The definition of balanced motion on page 57 is incomplete, no mention being made of a balance of forces at right angles to the motion. The definition of relative humidity adopted by the International Meteorological Organization in 1947 is omitted in favor of the older definition. An unfortunate omission is that of the integrated baroclinic (for example, thermotropic) models from the chapter on numerical prediction.

The author deserves high praise for accomplishing the formidable task of bringing synoptic meteorology up to date.

JEROME SPAR
Department of Meteorology and Oceanography, New York University

Polysaccharides in Biology. Transactions of the first conference, 27–29 April 1955, Princeton, N.J. Georg F. Springer, Ed. Josiah Macy, Jr., Foundation, New York, 1956. 271 pp. Illus. $5.

This book seems to be a verbatim transcription of a very informal conference. The table of contents looks interesting: "Problems of communication: nomenclature," M. L. Wolfrom; "Problems of classification," K. Meyer; "Bacterial polysaccharides," M. Heidelberger; and "Blood group substances," W. T. J. Morgan. Unfortunately the formal presentations are so frequently interrupted by questions and comments from the participants that it is very difficult to extract any useful information from the text. The comments are often amusing, if one has a taste for the macabre in science, and the book will make an interesting souvenir for the participants in the conference. This hardly seems justification for publishing such a book, and there is no excuse for selling it at $5.

MARK H. ADAMS
Department of Microbiology, New York University College of Medicine.

Bibliography of Solid Adsorbents, 1943–1953. An annotative bibliographical survey. NBS Circular 566. Victor R. Deitz. National Bureau of Standards, Washington, D.C., 1956 (order from Superintendent of Documents, GPO, Washington 25). iv + 1528 pp. $8.75.

V. R. Deitz and his collaborators at the National Bureau of Standards are to be commended for continuing to assemble the material that is published in this second volume in the series. The first volume covered the period 1900–42, whereas this one includes only the decade 1943–53. In spite of this shorter time period, the present volume cites twice as many publications as were listed for the previous four decades. However, the coverage is still restricted to heterogeneous phenomena at solid-liquid and solid-gas interfaces. Each entry is followed by a good abstract that has been prepared from the various abstract journals published here and abroad.

The authors list the references under seven chapter headings. Each chapter has a number of subsections. The first two chapters cover adsorption of gases and vapors and adsorption from solution, both on solid adsorbents. This material is followed by chapters on thermal effects and theories of adsorption. Chapter V is devoted to the refining of sugars and other applications of adsorbents. The last two chapters concern themselves with general information on adsorbents and special methods of investigation, together with the preparation of adsorbents. These are followed by a complete index of authors and subjects.

This reference volume does not claim to be complete, but the authors have not missed many publications. Workers in the field will find this volume more than useful, and younger investigators will be not only helped but stimulated by the thorough coverage of the important areas of solid-adsorbent research.

LLOYD H. REYERSON
Chemistry Department, University of Minnesota

Creatures of the Deep Sea. Klaus Günther and Kurt Deckert. Translated by E. W. Dickes. Scribner, New York, 1956. 222 pp. Illus. $3.95.

In general coverage of its subject, this is a thoroughly satisfactory volume, presenting an accurate, semipopular, overall picture and digested account of the known inhabitants of the deep sea. The scope of treatment may be judged by some of the chapter headings: "The poverty, sameness, extent, and inhabited regions of the deep sea," "Food of its fauna," "Inorganic foodstuffs," "Animal world of the ocean floor," and "Pelagic fauna and migration." The two most significant chapters deal with the biological peculiarities, distribution, and origin of deep-sea creatures.

To show one point of view of the authors, I quote a paragraph from one of the latter chapters.

"More general, though less striking at first, are the physical adaptations and peculiarities imposed on deep-sea animals by the other special features of their gloomy environment, the increasing cold in the depths, the relative stillness of the water, and the lack of calcium, especially