Book Reviews

Research Films in Biology, Anthropology, Psychology, and Medicine. Anthony R. R. Michaelis. Academic Press, New York, 1955. xvi + 490 pp. Illus. $10.

In the publication of this book, investigators as well as teachers in the biological sciences (including anthropology, psychology, and medicine) have a source of detailed, technical information that should enable beginners to begin to use and advanced workers more effectively to use cinematography. The book does not deal too exclusively with specific apparatus and, for this reason, it is not "dated." Rather, it is written to inform the reader in the general principles of the theory and art of cinematography. It is not a catalog of apparatus, yet it is a source of information about what general types of apparatus have been put together by scientists for the solution of their special problems and so may furnish suggestions for other installations.

The book is divided into three parts: 114 pages on the biological sciences (including such problems as bacterial growth and reproduction, tissue culture, embryology, locomotion, feeding mechanisms, circulation, nerves and sense organs, plant growth, tropisms, plant physiology, mycology, animal behavior); 91 pages on the "human sciences" (largely anthropology, psychology, and psychiatry); and 99 pages on the "medical sciences."

In each part Michaelis goes over the use of cinematography, reviewing some films already made. He discusses various special considerations in the area (for example, in animal behavior, the need for working in infrared for certain purposes). He then gives a comprehensive account of the application of cinematography in the main fields of research. For example, in the "medical sciences," applications of cinematography described are to external conditions, surgery, cavity exploration, x-ray analysis, locomotion, digestion, respiration, genitourinary system, circulation, sense organs, nervous system, pathology, and aviation medicine. In each case the scientific result revealed or elucidated by the use of cinematography is emphasized. There are thoroughly adequate and ample specific references throughout the text to a bibliography of 1490 titles.

I have had many years of experience with many kinds of cinematographic problems in biology, and I can say with full assurance that this book is the best in its field. Moreover, it should be a model for writers of "how-to" books—there is a fine balance between the treatment of the problem to be solved and the method of solving it. Unlike so many books on photography, the author of *Research Films* has a good grasp of, and a feeling for the biologist's point of view and language. The illustrations are excellent; the index is adequate.

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Principles and Applications of Physics. Otto Blüh and Joseph D. Elder. Interscience, New York, 1955. xiv + 866 pp. Illus. $7.

The turnover of physics textbooks in most western European countries has been much smaller than in the United States with its larger population of college-attending youth. Perhaps this is one reason why many textbooks of European origin are too encyclopedic to gain ready acceptance as required books in American universities. The book under review is based in part on Otto Blüh's earlier writing in Europe; it is considerably larger than most American textbooks. It is a mine of information addressed to the intelligent student who is expected already to have mastered some elementary physics. Without such a background, the pace at which the book proceeds would discourage the average student.

In the preface the authors express the hope that their book will have almost universal utility. "The text is adaptable to a one-year lecture course, when a selection of material according to the special requirements of the class will be necessary, but it contains ample material for a two-year course of which approximately one year would be devoted to classical, the other to modern physics. . . . Applications of physics have been adequately discussed as illustrations of the basic principles involved." In writing this book the authors "have attempted to fill the gap between elementary and advanced specialized textbooks." Following one of the senior author's special interests "consideration has been given . . . to the biologic, medical and radiological applications of physics . . . at the same time the text should provide for students of applied science and engineering a wider understanding of physics in conformity with the demands for the replacement of technical physics by basic . . . physics . . . . The integrating features of the book may perhaps also claim the interest of the graduate physics student, of the physics teacher . . . and of the scientists-at-large."

At a time when the proper teaching of physics is undergoing keen scrutiny, both by people within and without the physics profession, the authors have courageously written a book in which the traditional order and emphasis are not followed. Altogether it consists of 10 parts of somewhat unequal lengths dealing with the following: I, "Methods of physics, mathematics"; II–VI, "Basic concepts, mechanics, energy, fields, oscillations, thermodynamics"; VII - IX, "Corpuscles, atomic and nuclear physics"; X, "Scope and importance of the physical sciences."

In places the treatment is somewhat too condensed to be easily followed by a student who meets a topic for the first time. Teachers will certainly enjoy the volume, particularly part X. A junior or senior undergraduate major in physics might well put Blüh and Elder's volume on his list of Christmas or birthday wants and read it during his summer vacation.

The type face is large and clear; a few of the halftones (except for 10 or 12 plates) leave something to be desired; and the black cover is unattractive. But the book is an extremely good value at the price.

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Chemistry of the Soil. Firman E. Bear, Ed. Reinhold, New York, 1955. x + 373 pp. Illus. $8.75.

This monograph brings together a great part of the factual material needed for an understanding of the chemical nature of soils. Ten well-chosen areas (chapters) make it possible to present the significant facts of soil chemistry without serious overlapping. The authors of the chapters are well known through their contributions to the subject.

Soil development, by Barshad, deals with the methodology for interpreting soil-profile development in terms of the effect of developmental factors on parent material. Chemical composition, by Lawton, covers the gross elemental composition of primary minerals and soils.

Soil colloids are described by Toth through their schematic crystal structures and ion-exchange properties. But the exchange phenomena itself is rather thoroughly and competently explored in a separate chapter, by Wiklander, dealing with ion-exchange formulas, the Donnan equilibrium, membrane potentials, amphoteric reactions, and ion-exchange reactions between solids.

The chapter on soil organic matter, by Fraser, discusses plant constituents and their decomposition products. Kardos discusses soil fixation of plant nutrients and the chemical reactions involved that have special implications in soil fertility. Oxidation-reduction processes with respect to soil development and fertility are discussed by Merkle, while Thorne and Seatz cover the chemistry of acid, alkaline, alkali, and saline soils.

The world distribution of trace elements and their behavior in soils are described by Mitchell. The relationship of soil chemistry to plant nutrition, by Mehlich and Drake, forms the concluding chapter. It deals with ion adsorption by plant roots and nutrient availability as affected by soil reactions. An appendix, by Prince, on routine soil analysis is included.

Editor Bear and the authors are to be congratulated on this valuable contribution to the field of soil chemistry. Each chapter is well written and adequately documented. It is a book every worker in soil chemistry and soil fertility should possess, and it would make an excellent text or reference book for an advanced course in the principles of soil chemistry.

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Flora of Winnebago County, Illinois. Egbert W. Fell. Nature Conservancy, Washington, D.C., 1955. 207 pp. Cloth, $3.50; paper, $2.75.

Those concerned with the flora, vegetation, or ecology of the Middle West will be interested in this new book on one of the counties on the prairie border in northern Illinois. This book is the result of many years of careful study of the natural history of the northern part of Illinois; the author went there in 1921 to live.

The introduction is a description of the region, its geography, geology, climate, vegetation, and the range of habitats, with statistics on the geographic relationships of the components of the flora. The main part of the book is an annotated catalog of the vascular plants, with information on the local occurrence of each and interesting notes that particularly concern the plants in this county. Accompanying this are 33 pages of line drawings by the author, illustrating many of the more interesting species. A folded map in the back clarifies the local geography of the county, and a smaller map shows the areal relationships of original prairie and woodland and present-day wooded land.

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Physics and Microphysics. Louis de Broglie. Translated by Martin Davidson. With a foreword by A. Einstein. Pantheon, New York, 1955. 286 pp. $4.50.

This book is a collection of lectures and essays, for the most part, written, I would estimate, more than a decade ago. They suffer from the usual diseases of such a collection of much repetition and overlap. Many of the comments on the most recent scientific developments are seriously out of date, in spite of valiant efforts by the translator in the form of notes.

The book is divided into three parts. In the first, entitled, "Science," the author describes recent developments in science with special emphasis on wave mechanics, nuclear physics, and relativity. A historical approach is employed. These chapters are very lucidly written and can be understood by the nonspecialist, although they contain very little that is new for a competent physicist. The second section is entitled "Scientific philosophy." Here there is much emphasis on the comparison of space and time in classical and quantum physics and the relationship of this question to the wave-particle dualism.

One does not always agree with de Broglie, but his ideas are very interesting and thought-provoking. The road to a great discovery is not an easy one, but, as de Broglie points out in an essay on personal memories of the beginning of wave mechanics, a discovery such as the one he made presents many problems of understanding before it can become completely useful. He discusses the blind alleys he followed in an essay of great interest to me and, I am sure, to other physicists as well as to students of the history of science.

Another chapter in this section that is most ably presented is entitled, "The grandeur and moral value of science." On the other hand, the chapter on the relationship of modern science and the philosophy of Bergson was rather disappointing, probably because only a summary of the chapter is presented and is therefore much too sketchy to be satisfying. There are, however, many other hints throughout the book on the parallels between Bergson's philosophy and modern physics, which I hope de Broglie will someday discuss more extensively in a separate volume.

The third section is entitled "History of the sciences" and contains essays on the future of physics, the relationship of pure and applied science, a sketch on the history of the radio, and finally some remarks on nuclear energy, which, when one remembers that they were written before the explosion of the first atomic bomb, are remarkably prescient.

The book will prove to be of interest to the nonphysicist, who will find not only the philosophy of modern physics very clearly discussed but also such very important matters as the relationship between science and the scientist, between science and applied science, and between science and society illuminated by cogent and stimulating concepts.

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Ordovician Cephalopod Fauna of Baffin Island. Memoir 62. A. K. Miller, Walter Youngquist, and Charles Collinson. Geological Society of America, New York, 1954. vii + 234 pp. Illus. + plates.

The publication of this volume in the memoir series of the Geological Society of America is very timely, in addition to being intrinsically valuable, because of current special activity of the Geological Survey of Canada in exploration of the arctic region, including Baffinland. Several field parties working in Baffinland in the summer of 1955 have added materially to knowledge of areal geology and structure; a preliminary report on this work is now in preparation.

The study by Miller and coauthors is concerned primarily with the characters exhibited by 23 genera of nautiloid cephalopods obtained from a single locality (Silliman's Fossil Mount) near the southeastern extremity of Baffinland. Brief descriptions and excellent illustrations of various brachiopods, corals, and the widely distributed spongelike fossils (*Receptaculites*) are given also, and the volume contains a report on 23 species (four new genera and subgenera) of trilobites (by H. B. Whittington) as well