soils and its relationship to the diagenetic changes that are taking place in these sediments and to the weathering processes in soils. Illustrations are drawn from the Chesapeake Bay area, from Iowan loess, and from a soil profile on limestone. Variations in the properties of bentonites are connected with the clay minerals present. The occurrence of chlorite and mixed layered minerals and new techniques for identifying the components of complex clay minerals are adequately described.

Not everyone will agree with everything that appears in this collection of voluntary contributions of papers representing the entire field of clay studies, but everyone who reads this volume will find many things of interest and of value. I recommend this book as an important contribution to the literature on clays and clay mineralogy; as such, it is indispensable to anyone who wishes to keep informed of the progress in research on clay materials.

VICTOR T. ALLEN
Institute of Technology,
Saint Louis University

Biochemical Preparations. vol. 4. W. W. Westerfeld, Ed. Wiley, New York; Chapman and Hall, London, 1955. vii + 108 pp. $3.75.

This volume continues the presentation of carefully checked and annotated methods for preparation of substances of biochemical interest. This series may profitably be consulted not only for complete directions to follow to obtain specific materials, but also for information about the techniques that are employed in these procedures; the techniques are described fully and in an essentially critical way.

The current volume includes chemical methods for the preparation of a number of relatives or possible catabolites of several of the amino acids and sugars: L-histidinol dihydrochloride, carnosine, *N*-acetyl imidazole, homogentisic and L-argininic acids, DL-methionine sulfoxide and the sulfones of DL-methionine and DL-ethionine, *a*-D-glucose-1-phosphate, tetraacetyl-D-ribofuranose (tetraacetyl-D-ribopyranose, a by-product), glycolaldehyde, and sodium glyoxylate monohydrate. Urocanic acid is prepared from histidine by the action of histidase, *a*-D-glucose-1-phosphate from starch by the action of phosphorylase, and D-glutamic acid from the racemic mixture by destroying the enantiomorph with L-glutamic decarboxylase (2 procedures). Preparations of crystalline *a*-lactalbumin, β-lactoglobulin, alcohol dehydrogenase, and inorganic pyrophosphatase are included. Column chromatography has been used to isolate (dipalmitoleyl)-L-*a*-lecithin, and fractional distillation to obtain linoleic acid and methyl linoleate.

A cumulative index for volumes 1 through 4 and a listing of the compounds of biochemical interest that have appeared in *Organic Syntheses* (through volume 34) are included.

RALPH C. CORLEY
Department of Chemistry,
Purdue University

The Marine and Fresh-Water Plankton. Charles C. Davis. Michigan State University Press, East Lansing, 1955. 562 pp. Illus. $10.

American aquatic biologists have been eagerly awaiting this unique work on plankton, but many of them will experience variously mixed feelings of satisfaction and disappointment when they examine it. It is admittedly pitched toward the level of "graduate students and seniors" in colleges and universities, but in my estimation, and from the student's standpoint, the first 141 pages will probably prove to be the most useful. These well organized chapters comprise discussions of limnetic plankton ecology, adaptations, plankton production, spatial and seasonal distribution, food and feeding, and so forth. Although these pages deal with both marine and fresh-water plankton, the treatment is blended and handled in an efficient manner so that the reader is not likely to confuse or misinterpret the planktonic and ecological factors of the two environments.

For the most part, the material is necessarily general rather than critical, but unfortunately the generalizations are sometimes carried too far. For example, a student who reads the section on the annual cycle of oxygen in lakes will probably gain the impression that the hypolimnion *always* becomes anaerobic in all lakes during the summer months. Undoubtedly many readers will take exception to the accuracy of certain statements, such as the following selections: "A pond is a shallow lake with rooted submerged vegetation" (p. 3); "Like most salt lakes, the Caspian Sea has many inlets" (p. 7); "The area of . . . Lake Chad may . . . decrease to only 6,000 sq. mi. in the dry season" (p. 8); "Lake Superior with a depth of 1,000 ft. . . ." (p. 8); ". . . lakes vary greatly in their hydrogen and hydroxide ion concentrations (*p*H)" (p. 10); "The line of demarcation between the two layers [epilimnion and hypolimnion] is known as the thermocline" (p. 13); ". . . stonefly larvae, mayfly larvae . . ." (p. 258); "Book lung —in certain of the Arachnoidea, an external respiratory device" (p. 282).

Pages 142 to 279 include short characterizations of the main taxonomic categories of marine and fresh-water zooplankton and phytoplankton, as well as keys to common genera. Examples of the scope of a few selected keys are as follows: Cyanophyta, 19 genera; Bacillariaceae, 22; Mastigophora, 41; Foraminifera, 8; Coelenterata, 95; Rotifera, 17; Cladocera, 14; and Urochorda, 7.

Pages 281 to 295 contain a glossary of terms used especially in the keys. The literature list (pp. 297–320) is, in general, well chosen and fairly inclusive through 1952.

Although the discussion material in the first quarter of the book contains some captioned line cuts, most of the figures (49 to 681) are included all together on pages 353 to 539. It is unfortunate that these figures are indicated by number only, all of the captions being completely isolated *en masse* on pages 321 to 351. Some of the figures are good, others are acceptable, but a surprisingly large number are poor. Few figures are original. A great deal of space has been wasted by inadequate grouping of the figures. Page 354, for example, shows only *Coelosphaerium* and *Microcystis*; page 358 has two diatom figures; page 380 shows just two green algae cells; and page 458 contains one needlessly large diagram (unlabeled) of a rotifer.

ROBERT W. PENNAK
Department of Biology,
University of Colorado

Semimicro Qualitative Analysis. Frank J. Welcher and Richard B. Hahn. Van Nostrand, New York–London, 1955. vii + 497 pp. Illus. College, $6.50; reference, $8.

Welcher and Hahn have added another textbook to the already voluminous literature of qualitative analysis. The authors have organized their treatment into three main divisions—theoretical, reference, and experimental.

The principles necessary for an understanding of qualitative analysis are discussed in the theoretical section. A brief description of the structure of the atom is included in order to aid the student in correlating and predicting behavior of the various elements. Whenever possible, the examples cited in this section have been drawn from the experimental procedures. Following each chapter there are a number of questions for the student, together with numerical problems where they are applicable.

The reference section treats each element covered in the experimental scheme by listing oxidation states; coordination numbers; formulas of ions; complex ions formed; and reactions of the element and its compounds with acids, bases, and re-

agents used in the procedures. Balanced equations are given for each reaction.

The experimental section in general follows a conventional hydrogen sulfide system of analysis. However, titanium has been added to the ammonium sulfide group, lithium hydroxide is used to separate the copper and arsenic subgroups, and strontium is separated from calcium with concentrated nitric acid. The procedures are designed for a " 'large' semimicro scale" in which 1 to 25 milligrams of a constituent are present in 1 milliliter of solution. Following a brief discussion of the steps involved in the separation and detection of the ions of a group or subgroup, the experimental procedures are then presented compactly in tabular form.

In general, the book is very well written. The style is quite readable, and the format and organization are excellent. However, I feel that the student might gain more from some of the illustrative problems if they were solved by reasoning from principles rather than by substituting into previously derived equations. The authors' practice of considering the simple ionic species of an element in solution rather than the appropriate complex ion where this species is known is often misleading. The treatment of the hydrolysis of salts of polyprotic acids, such as the bicarbonate ion, serves only as a very poor first approximation. With regard to the experimental section, some of the procedures appear to give very incomplete separations. The authors, however, do not claim that the separations used are the most sensitive or the most rapid, but only that they "give the most reliable results in the hands of beginning students."

The desirability of another textbook of qualitative analysis based on hydrogen sulfide separations may seem questionable, but the lucid theoretical treatment and the extremely complete reference section make this book a worth-while contribution to the field.

ROY A. WHITEKER
Department of Chemistry,
Massachusetts Institute of Technology

Physics of Fibres. An introductory survey. H. J. Woods. Institute of Physics, London, 1955. 100 pp. Illus. + plates. 30s.

Studies of the structures and properties of fibers are becoming increasingly more important with the rapid development of new fibers and the many modifications of the natural fibers to provide the functional and esthetic characteristics that are demanded of modern textiles. Physicists have embarked only in recent years in the research and development work of the textile industry. The demand for this work, however, is constantly growing, and therefore this little book of 100 pages on the physics of fibers is published at a very opportune time.

The six chapters of the book are concerned with general fiber structures; general physical fiber properties; x-ray investigations; optical properties; elastic properties; and electron microscopy of fibers. In each chapter, the author describes the fundamental techniques for the physical measurements and discusses the importance of the results. The eight electron micrographs included in the last chapter are excellent and typical of natural fibers.

The book is not a compilation of photographs and experimental data. In fact, it does not contain a single table of results; however, values pertinent to the discussion are provided in the text. The author condenses a wealth of information in each chapter and guides the reader to specific references in the event further reading and more details are desired.

In addition to the list of 185 references, a bibliography of technical and nontechnical books is given for each chapter. The book is well written and contains an excellent subject index. It is highly recommended to scientists who are engaged in fiber research as well as to those of other fields who may be interested in a general knowledge of the physics of fibers.

HERBERT F. SCHIEFER
Textiles Section,
National Bureau of Standards

New Books

Techniques Générales du Laboratoire de Physique. vol. 1. J. Surugue. Centre National de la Recherche Scientifique, Paris, 1955. 671 pp. F. 2400.

Life, the Great Adventure. Jean Rostand and Paul Bodin (based on a translation by Alan H. Brodrick). Schribner's, New York, 1955, 1956. 228 pp. $3.50.

Microbiology. General and applied. William B. Sarles, William C. Frazier, Joe B. Wilson, Stanley G. Knight. Harper, New York, ed. 2, 1956. 491 pp. $5.75.

The Gardener's Bug Book. Cynthia Westcott. American Garden Guild and Doubleday, New York, 1956. 579 pp. $7.50.

New Worlds of Modern Science. Leonard Engel, Ed. (reprints from various sources). Dell, New York, 1956. 383 pp. $0.35.

Current Anthropology. A supplement to *Anthropology Today.* William L. Thomas, Jr., Ed. University of Chicago Press, Chicago, Ill., 1956. 377 pp. $5.

Sunken Islands of the Mid-Pacific Mountains. Geological Society of America Memoir 64. Edwin L. Hamilton. Geological Society of America, New York, 1956. 97 pp.

Closed-Circuit and Industrial Television. Edward M. Noll. Macmillan, New York, 1956. 230 pp. Paper, $4.95.

Introduction to Biological Science. A study of the human body and of the world of plants and animals. Clarence W. Young, G. Ledyard Stebbins, Frank G. Brooks (abridgement of *The Human Organism and the World of Life*). Harper, New York, 1956. 555 pp. $4.75.

Engineering in History. Richard S. Kirby, Sidney Withington, Arthur B. Darling, Frederick G. Kilgour. McGraw-Hill, New York, 1956. 530 pp. $8.50.

Miscellaneous Publications

(Inquiry concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

A Geological Reconnaissance of Panama. Occasional Papers, No. XXIII. Robert A. Terry. California Academy of Sciences, San Francisco, 1956. 91 pp.

A Chemical Study of the Peats of Quebec. P.R. No. 306. J. Risi, C. E. Brunette, H. Girard. Quebec Department of Mines, Quebec, Canada, 1955. 45 pp.

Carnegie Institution of Washington Year Book No. 54. 1 July 1954–30 June 1955, with administrative reports through 9 Dec. 1955. Carnegie Institution, Washington, D.C., 1955. 311 pp. Paper, $1; cloth, $1.50.

The Photonuclear Effect and the Complex Potential-Well Nuclear Model. Notas de Física, vol. II, No. 2. J. P. Davidson. *Shell Effect on Photonuclear Reactions.* Notas de Física, vol. II, No. 4. J. Goldemberg and J. Leite Lopes. 3 pp. + tables and charts. *Note on the Non Relativistic Equation for Spin ½ and 1 Particles with Anomalous Magnetic Moment.* Notas de Física, vol. II, No. 5. J. J. Giambiagi. 10 pp. *Relativistic Theory of Spinning Point Particles.* Notas de Física, vol. II, No. 6. J. Tiomno. 20 pp. *The Formation of P^{32} from Atmospheric Argon by Cosmic Rays.* Notas de Física, vol. II, No. 7. L. Marquez and Neyla L. Costa. 8 pp. Centro Brasileiro, de Pesquisas Físicas, Rio de Janeiro, Brazil, 1955.

Nuclear Metallurgy. IMD special report No. 2. Symposium arranged by Nuclear Metallurgy Committee. Benjamin Lustman, chairman. American Institute of Mining and Metallurgical Engineers, New York, 1956. 94 pp. $3.75.

Casting Techniques for Explosives and Other Nonmetallic Materials. Thomas C. Goodwin, Jr. Maurice W. Ayton, Ed. Technical Information Division, Library of Congress, Washington, D.C. (order from Card Division, Library of Congress, Washington 25). 50 pp. $0.45.

Land Acquisition, 1955. Highway Research Board Bull. 113. 83 pp. $1.80. *Design and Testing of Flexible Pavement.* Highway Research Board Bull. 114. 87 pp. $1.65. *Vertical Sand Drains for Stabilization of Embankments.* Highway Research Board Bull. 115. 52 pp. $0.90. *Experimental Concrete Pavements.* Highway Research Board Bull. 116. 71 pp. $1.35. National Academy of Sciences–National Research Council, Washington 25, D.C., 1955, 1956.