Physics

Strange Particles. Robert Kemp Adair and Earle Cabell Fowler. Interscience (Wiley), New York, 1963. viii + 151 pp. Illus. $4.75.

This brief tract has five chapters, the first a short history and an informal review of symmetry principles and the conservation laws associated with them. In the second chapter, the special properties of the strange elementary particles ("strange" is not just an ugly word but has quantitative meaning) are given. Unlike electric charge, some of the more recently discovered attributes of elementary particles are not inherited by their decay products, so that presenting the properties of strange particles requires careful discussion.

The following two chapters deal with the strong and the weak interactions. The forces that give rise to these interactions are respectively first and third in order of decreasing strength in the hierarchy of forces as they are presently understood. (No new light has been shed on electromagnetic and gravitational forces—second and fourth, respectively—by the discovery of the strange particles.) The final chapter gives a review of the quantum mechanical formalism used in treating particle interactions.

Adair and Fowler have achieved a miracle of compression; the whole book is of the order of only 50,000 words. Often this compression is so great that for a paragraph or two of text the reader will have to spend at least a day reading and digesting the many references and their antecedents. For example, in their treatment of the neutral K-mesons, the concentrated K°-ration first given contains only five sentences for the whole K°-$\overline{K}^\circ$ versus the K_1°-K_2° story! The reader welcomed in the introduction if he has "some familiarity with the physics of pions and nucleons" will have to give gallons of sweat to reconstitute this pure protein. Fortunately, but not foreseeably, he will find additional discussion of K°'s as he reads further.

Nevertheless the coverage in this book is broad and the depth is profound. Most of the questions asked by intelligent graduate students are answered here categorically and with exceptional insight. The authors wisely have not tried to include in detail the most recent attempts at theories of strong and weak interactions of strange particles, since the time lag in publication would make such an attempt a hopeless task in such a rapidly changing field as strong interactions, and a treatment of the weak interactions would be too long a story.

Strange Particles is a notable addition to the several superb little books on elementary particles that have been published in the past decade, among them the book by Marshak and Sudarshan, which thoroughly covers the formal application of the quantum theory of linear fields to elementary particles, Fermi's old and Feynman's new lectures, Jackson's survey, and many more specialized treatises. Perhaps the time has come to present such tracts in even smaller format, so that along with a little magnifying glass to read them, an up-to-date particle-physics wallet card, several Nonprofit Organization Transportation Tax Exemption Certificates, and a passport, the books can be carried in the pockets of the busy elementary particle physicist.

D. H. FRISCH
Department of Physics,
Massachusetts Institute of Technology

Inorganic Chemistry Textbook

Modern Approach to Inorganic Chemistry. A textbook for higher national certificate and general degree students. C. F. Bell and K. A. K. Lott. Butterworth, Washington, D.C., 1963. x + 293 pp. Illus. $8.95.

This textbook, which is intended primarily for higher national certificate and general degree students in British schools, a group roughly equivalent to our bachelor's degree candidates, attempts to provide, within a compass of less than 300 pages, a survey of fundamental inorganic chemistry at the undergraduate level. The approach is reminiscent of Gould's in his *Inorganic Reactions and Structure* (Holt, Rinehart, and Winston, 1955), but this book is even more condensed and telegraphic. A criticism of Gould's book—that it was more an outline of study than a text—is even truer of this work; moreover, unlike Gould, there are no exercises. The references, mostly to books and review articles, are few (less than 45); the majority of these are English, and the most recent is dated 1961.

The theoretical portions, which constitute almost three-fourths of the book, assume only a limited mathematical background and succinctly present atomic structure, the Periodic Table, and chemical bonding. The authors emphasize structural and stereochemical aspects, coordination compounds, oxidation-reduction reactions, and acid-base theory. Frequent reference is made to thermodynamic data. Uses of physical measurement in inorganic chemistry are summarized in an appendix.

The comparative descriptive chemistry of all the elements is dealt with in two unusually brief chapters (only 80 pages), and necessarily the emphasis is on trends, with some groups of elements allotted less than a page. A welcome summary of transition metals cuts across conventional Periodic Table groups. Unfortunately, despite what was probably the most exciting discovery in inorganic chemistry in 1962, we find the statement that "there are no compounds of [the rare gases]" (p. 199). A passing reference to XeF_4 does little to correct this misconception. With this exception, most of the topics considered modern are included.

Instructors to whom the Gould approach appeals would do well to examine this volume. For actual class use, it undoubtedly would have to be supplemented; but in all fairness it must be noted that its coverage of certain topics is unusually good, and in this respect it may itself be used to supplement other texts. For example, a chapter on the distribution and extraction of the chemical elements summarizes elementary geochemistry, which is usually neglected in textbooks. Considering its length and other limitations, the price of the book seems excessive.

GEORGE B. KAUFFMAN
Fresno State College and
Universität Zürich

Biogeography

Marine Distributions. M. J. Dunbar, Ed. University of Toronto Press, Toronto, Canada, 1963. viii + 110 pp. Illus. $5.

Biogeography has been unfashionable for far too long. The progress of ecology is hindered by our ignorance of animals and plants in the places where they live. This book is a modest attempt to demonstrate the need for a new quantitative biogeography incorporating the results of physical and chemi-

cal as well as biological investigations. The book contains six papers given in 1962 during a symposium of the Royal Society of Canada, the joint sponsor, with the National Academy of Sciences of the United States, of the new *Serial Atlas of the Marine Environment* (which is introduced in this volume by Dunbar).

One paper describes the seasonal cycling of the thermocline in the North Pacific; it is a pity that there is no discussion of the biological implications. Three papers deal with the distributions of animals and plants—one with the seaweeds of the northeast coast of the Pacific and two with the zooplankton of the North Atlantic. All three relate the distributions of species to the identity and movements of water masses. The final paper is concerned with osmoregulation of Crustacea and provides an example of the physiologist's contribution to the problems of biogeography.

All but one of the papers consist of a study of a few organisms, on the one hand, in relation to one or two physical parameters, on the other. Only one paper (and that very briefly) mentions that part of the environment which consists of the other animals and plants. This incomplete and piecemeal approach is, perhaps, inevitable in the present state of knowledge, but it draws attention to the need for the analysis of nature as an integrated whole with all its physical, biological, and chemical interactions.

Perhaps the most valuable part of the book is a summary, by L. A. Walford, that contains many seeds of wisdom which should be encouraged to germinate.

R. S. GLOVER
Oceanographic Laboratory, Edinburgh, Scotland

Note

Chemistry

In this second edition of their excellent monograph, **Interfacial Phenomena** (Academic Press, New York, ed. 2, 1963. 494 pp. $15), the authors, J. T. Davies and E. K. Rideal, have corrected some minor errors and added a small amount of new material. [See *Science* **134**, 1611 (1961) for a review of the first edition.]

The new material deals with the damping of waves on water and with the circulation in small droplets. In treating the first of these topics, the authors deal with the propagation of low-amplitude waves on clean surfaces and discuss the problems of obtaining clean water surfaces. They discuss the effects of adsorbed monolayers and of insoluble, spread monolayers, and include a new table of results obtained for damping coefficients, which shows the generally good agreement between observed and calculated values when one is dealing with low-frequency waves. At higher frequencies, as the authors point out, there is a problem of "short-circuiting" of surface stresses owing to surface pressure fluctuations in the peaks and troughs of the waves. Some of the results presented show that the change in damping coefficient occurs at frequencies consistent with known relaxation times in adsorbed films.

The treatment of the circulation of small drops, which has an important bearing on the problem of liquid-liquid extraction processes, has been slightly extended on the basis of a recent publication by one of the authors (Davies). If one can judge by my review copy, it appears that the quality of the halftone illustrations has been improved in the second printing.

ERIC HUTCHINSON
Department of Chemistry, Stanford University

New Books

Biological and Medical Sciences

Introduction to Modern Biochemistry. P. Karlson. Translated from the German edition (Stuttgart, 1962) by Charles H. Doering. Academic Press, New York, 1963. 451 pp. Illus. $10.

Medical and Biological Problems of Space Flight. Proceedings of a conference, November 1961. Geoffrey H. Bourne, Ed. Academic Press, New York, 1963. 299 pp. Illus. $12.

Mental Retardation, Second International Congress on, Proceedings. vol. 1, *Organic Bases and Biochemical Aspects of Imbecility* (424 pp.); vol. 2, *Psychological and Sociological Problems in Imbecility Drug Treatment* (269 pp.). Otto Stur, Ed. Karger, New York, 1963. Illus.

Metabolic Inhibitors. A comprehensive treatise. vol. 1. R. M. Hochster and J. H. Quastel, Ed. Academic Press, New York, 1963. 689 pp. Illus. $26.

Methodology in Basic Genetics. Walter J. Burdette, Ed. Holden-Day, San Francisco, Calif., 1963. 496 pp. Illus. $5.

Naming the Living World. An introduction to the principles of biological nomenclature. Theodore Savory. English Univ. Press, London, 1962; Wiley, New York, 1963. 142 pp. $3.95.

Newer Methods of Nutritional Biochemistry. With applications and interpretations. Anthony A. Albanese, Ed. Academic Press, New York, 1963. 595 pp. Illus. $18.50.

Perspectives in Virology. vol. 3. Morris Pollard, Ed. Harper and Row, New York, 1963. 314 pp. Illus. $10.50.

Primary Embryonic Induction. Lauri Saxén and Sulo Toivonen. Logos Press, London; Prentice-Hall, Englewood Cliffs, N.J., 1963. 283 pp. Illus. $8.75.

Principles of Paleoecology. An introduction to the study of how and where animals and plants lived in the past. Derek V. Ager. McGraw-Hill, New York, 1963. 383 pp. Illus. $10.75.

Progress in Nucleic Acid Research. vol. 1. J. N. Davidson and Waldo E. Cohn, Eds. Academic Press, New York, 1963. 438 pp. Illus. $13.

Radioecology. Proceedings of a symposium (Fort Collins, Colo.), September 1961. Vincent Shultz and Alfred W. Klement, Jr., Eds. Published for the American Institute of Biological Sciences by Reinhold, New York, 1963. 766 pp. Illus. $16.50.

Recent Progress in Microbiology. A symposium (Montreal, Canada), August 1962. N. E. Gibbons, Ed. Univ. of Toronto Press, Toronto, Canada, 1963. 735 pp. Illus. $21.50.

Research Problems in Biology. Investigations for students. Series 1 and 2. Prepared under the direction of the American Institute of Biological Sciences. Doubleday, Garden City, N.Y., 1963. Series 1, 277 pp.; Series 2, 274 pp. Paper, 95¢ each.

Die Rohstoffe des Pflanzenreichs. vol. 2, *Antibiotiques.* G. Hagemann. Cramer, Weinheim, Germany, 1963. 276 pp. Illus.

Solute Uptake by Intact Plants. Arthur Wallace. The author, Los Angeles, 1963. 184 pp. Illus. $4.

Spectrophotometric Analysis of Drugs, Including Atlas of Spectra. Irving Sunshine and S. R. Gerber. Thomas, Springfield, Ill., 1963. 253 pp. Illus. $10.50.

Systema Helminthum. vol. 4, *Monogenea and Aspidocotylea* (707 pp. $80); vol. 5. *Acanthocephala* (431 pp. $60), Satyu Yamaguti. Interscience (Wiley), New York, 1963. Illus.

Symptoms of Virus Diseases in Plants. L. Bos. Centre for Agricultural Publications and Documentation, Wageningen, Netherlands, 1963. 132 pp. Illus.

Techniques in Parasitology. A symposium (London), October 1962. Angela E. R. Taylor. Davis, Philadelphia, 1963. 115 pp. Illus. Paper, $3.25.

Tissue Cultures in Biological Research. G. Penso and D. Balducci (English edition of *Le Colture dei Tessuti nella Ricerca Biologica*). Elsevier, New York, 1963. 476 pp. Illus. $18.

Treatise on Asthma. The medical writings of Moses Maimonides. Translated from the Arabic. Suessman Muntner, Ed. Lippincott, Philadelphia, 1963. 141 pp. Illus. $5.

Vascular Allergy and Its Systemic Manifestations. Joseph Harkavy. Butterworth, Washington, D.C., 1963. 312 pp. Illus. $10.75.

Viruskrankheiten des Menschen. vol. 1, pt. 7. Eugen Haagen. Steinkopff. Darmstadt, Germany, 1963. 95 pp. Illus. Paper.