

tions to the "fine structure" of light-scattering theory especially as the theory relates to polyelectrolyte and associated colloidal systems. The text, in a full development of basic scattering theory, makes no mention of these and similar developments. It is almost as if Dr. Mysels were hiding his light scattering under a bushel.

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Homolytic Aromatic Substitution, G. H. WILLIAMS. Pergamon Press, New York-Oxford-London-Paris, 1960, vii + 133 pp. \$7.50.

This book represents a successful attempt on the author's part to condense and organize the rather large amount of material now available for the process of introducing a free radical into an aromatic system. Certainly one of the strong features of the book is the tendency to cite data extensively when preparing or presenting an argument for a particular point of view. After a general introduction there are chapters on the theoretical treatments of aromatic substitution, homolytic arylation reactions, quantitative investigation of homolytic arylation, intramolecular arylation, alkylation, and hydroxylation and some other substitution reactions.

Chapter 4 is written very well and I would urge anyone teaching a course in organic chemistry at the first year graduate level to include some of this chapter in the presentation of free-radical reactions.

The book is well organized and the reference list is very complete. I am pleased to recommend this book to anyone in the organic field.

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Soviet Research on Organo-Phosphorus Compounds, 1949-1956, Parts I, II, III. Consultants Bureau, Inc., New York, 1960, 1208 pp. Part I, \$50.00; Part II, \$50.00; Part III, \$30.00; Complete Collection \$120.00.

These high-priced books consist of English translations of 279 technical articles selected from the following Russian journals: *J. Appl. Chem.*, *Bull. Acad. Sci.*, *Proc. Acad. Sci.*, *J. Gen. Chem.*, and *J. Anal. Chem.* The articles are sorted into the three volumes on the basis of the chemistry involved. Thus, Part I deals with (A) derivatives of organic phosphorus acids containing the C—O—P linkage; (B) derivatives of organic phosphorus acids containing the C—O—P—S or C—S—P linkages; and (C) effects of inorganic phosphorus compounds on organic compounds or reactions. Part II deals with (A) derivatives of organic acids of phosphorus containing the C—P—O bond and (B) derivatives of organic phosphorus acids containing the C—P—S bond; and the final volume with (A) inorganic complexes of organic compounds of phosphorus; (B) phosphines, phosphine oxides, phosphonium compounds, and their selenium, nitrogen, sulfur and halogen derivatives; and (C) nitrogen-containing derivatives of organic phosphorus compounds. Because of the generally high quality of Soviet research in organic-phosphorus chemistry, these volumes are a worthwhile collection. Unfortunately, they are not indexed more completely than the headings listed above, plus a table of contents

in each volume giving the titles and authors of the papers and their original literature sources. This means that it is very difficult to look up information on a particular compound or particular experimental technique.

These books have value to two classes of chemists: One is the industrial research organization which is spending significant sums of money in the organic-phosphorus field. For the sake of convenience, such an organization can probably afford the \$120.00 price for the set of three volumes, even though the same information is probably available in their library copies of the translated Soviet journals, which are also obtained from Consultants Bureau, Inc. Presumably such an organization might buy a set for each group or laboratory working in the field. The other class of chemists to which this collection may appeal is organic phosphorus investigators working in an academic institution where the particular journals are not available. There seems to be no particular advantage for general chemical libraries subscribing to the translated journals from which the contents of this set of books has been culled to purchase the set.

It is hoped that the publishers will keep this series up to date by issuing supplements in the future. Otherwise, the value of this set of books covering the arbitrary period 1949-1956 becomes questionable. The books are paper-bound and the pages are reproduced from proportional-spaced typewriting as are the published English translations of the Russian scientific journals from which the papers were collected.

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Introduction to Quantum Field Theory. F. MANDL, Interscience, New York-London, 1959. vii + 202 pp. \$6.00.

Quantum field theory is a difficult subject for the average physicist, and its knowledge has long remained restricted to a small number of specialized theoreticians. Before the war familiarity with this topic was not essential to experimental physicists, since its applications were mainly confined to radiation theory and the results were well known and could often be derived by simpler if less elegant and satisfactory methods. The great development of field theory in the fifties in connection with mesons and other new unstable particles now requires some knowledge of quantum field theory, at least by workers in nuclear and high-energy physics.

Professor Mandl is responsible for the so far most effective attempt to render quantum field theory more widely accessible. The success of his book, *Quantum Mechanics*, led us to expect an equally compact and lucid treatment of field theory, and in the reviewer's opinion he has achieved this aim. The reader is assumed to possess a good knowledge of particle quantum mechanics and is taken by successive steps through the theory of systems with an infinite number of degrees of freedom, beginning with a single field and soon going over to the more important case of interacting fields. The mathematical formalism, even in a simplified treatment like this one, is sometimes rather unfamiliar to the classical physicist, but that is a price that must be paid to enter this latest and most important domain of theoretical physics. The first chapters are devoted to classical fields and their quantization. There follows the theory of interacting fields, the meson field, and radiation. After explaining the methods of the scattering matrix and Feynman graphs, the author is able to lead the reader through applications which include some of the outstanding successes of modern field theory. Among these are the calculations of the interactions of charged particles with the electromagnetic field which predict the exact values of the anomalous magnetic moment of the electron and the "Lamb shift" of the hydrogen energy levels. A series of exercises of variable scope and difficulty is included, and an appendix summarizes the relativistic Dirac theory of the