

effect of the introduction of an *N*-oxide function into a compound, it is disappointing that so few biologically useful *N*-oxides have been found. The two amine oxides having the most widespread use, chlordiazeoxide and 2-mercaptopyridine 1-oxide, are not aromatic *N*-oxides despite the nomenclature of the latter. One of the chapters of Professor Eiji Ochiai's "Aromatic Amine Oxides," reviews in detail the attempts to employ *N*-oxidation in favorably altering biological properties.

Other chapters of this comprehensive and informative treatise cover the history, the preparation, and the reactions of the aromatic heterocyclic *N*-oxides. Electrophilic and nucleophilic substitution of compounds containing *N*-oxides and the effects of an *N*-oxide function upon other substituents are reviewed.

As befits a true expert, Professor Ochiai has called upon another, Dr. C. Kaneko, to provide a chapter on the physicochemical properties of the amine oxides. The book is limited to the aromatic *N*-oxides as its title indicates, but aliphatic *N*-oxides receive some attention for the purposes of differentiation.

It is a tribute to Professor Ochiai's 1953 article in the *Journal of Organic Chemistry* (18, 534) that so much of the western synthetic work recorded here was stimulated by that seminal review. Nevertheless, a large part of the original work on *N*-oxides has been published in Japan, and it is helpful that experimental details for many syntheses are provided in this volume.

The personal identification of Professor Ochiai with this segment of organic chemistry—an identification of a type that is rare nowadays—makes this an especially attractive book. Its long-term usefulness makes it well worth owning.

The translation is serviceable but is not always idiomatic and better editorial work by the publisher might have changed such awkward usage as "active to substitution." A grossly incomplete author index is included. The literature has been reviewed through 1963.

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Fundamentals of Immunology. 4th ed. By WILLIAM C. BOYD. Interscience Publishers, Inc., 605 Third Ave., New York, NY 10016, 1966. xvii + 773 pp. 15.5 × 23 cm. Price \$14.95.

"Fundamentals of Immunology" continues to be an excellent text for the beginning student and as indicated in the title, does not require previous knowledge of the subject. Exception must be taken to the phrase on the fly-leaf, "completely rewritten." Although there has been updating in some chapters, it might be more accurate to state that the book has been reprinted. It is difficult to know just how much material on laboratory and clinical techniques should be included in a book of this type, but it is this reviewer's opinion that more techniques should have been added rather than deleted in this issue. This reviewer also feels that development of fluorescent antibody techniques and applications would have been advantageous to the reader.

As in previous editions, all phases of immunology are developed or at least mentioned. The book includes chapters on: Immunity and Immunology, Antibiotics and Antibody Specificity, Antigens, Cell Antigens, Blood Groups, Antibody-Antigen Reactions, Complement and Complement Fixation, Immediate Hypersensitivity, Delayed Hypersensitivity, Non-Immunological Equivalents of Hypersensitivity Reactions, Hypersensitivity and Immunity, Immunological Tolerance and Intolerance, Autoimmunization and Disease, Immunity in Action, Practical Use of Immunity and Hypersensitivity, Laboratory and Clinical Technic, and Quantitation and Statistical Methods in Immunology. Comprehensive references are provided at the end of each chapter for those individuals who wish to delve more deeply into the text material.

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Peptides. Edited by H. C. BEYERMAN, A. VAN DE LINDE, and W. M. VAN DEN BRINK. North-Holland Publishing Co., Amsterdam, Holland. Available in the U. S. from John Wiley & Sons, Inc., 605 Third Ave., New York, NY 10016, 1967. xii + 292 pp. 15.5 × 23 cm. Price \$14.50

This book, the latest in the series of publications of the Proceedings of annual European Peptide Symposia, is a welcome addition to the desk of researchers interested in peptide work. There are eight sections, and each section contains the presentations by authors intimately associated with the material presented. Bibliography of most of the articles in this book is most up-to-date and is intended to familiarize the reader with pertinent information concerning various aspects of peptide chemistry.

While the sections of this book devoted to coupling methods, protecting groups, synthesis of peptides with polymeric supports, and mass spectroscopy in peptide chemistry, are of general interest, the medicinal chemists, however, will benefit most from sections on sequential polymers, racemization, and biologically active peptides. Among the peptides with biological activity, a very interesting discussion is focused on the recent developments in the synthesis of biologically active corticotropin fragments. Several peptides with biological activity, such as human gastrin, glucagon, secretin, melittin, and others, have also been discussed from a synthetic and biological activity point of view.

The only improvement in this book would have been the inclusion of subject index.

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Emulsion Science. Edited by PHILIP SHERMAN. Academic Press, Inc., Ltd., Berkeley Square House, Berkeley Square, London, W.1. U. S. Academic Press, Inc., 111 Fifth Avenue, New

York, NY 10003, 1968. 16 × 23.5 cm. x + 496 pp. Price 115s \$21.00.

Emulsion Science is divided into five sections or chapters as follows: (1) Principles of Emulsion Formation, by E. S. R. Gopal; (2) The Theory of Stability of Emulsions, by J. A. Kitchener and P. R. Mussellwhite; (3) General Properties of Emulsions and their Constituents, by Philip Sherman; (4) Rheology of Emulsions, by Philip Sherman; (5) Electrical Properties of Emulsions, by Tetsuya Hanai.

The author-editor has done an excellent job in correlating and unifying the contributions of the other authors. The text is well organized and comprehensive with good continuity and a minimum of overlap. The first three sections are primarily descriptive, but sufficiently quantitative to give adequate depth to the subjects covered. While some differences in style and organization may be expected, only a minimum is actually encountered. For example, demulsification is discussed in Section 1 while Section 2 is devoted entirely to emulsion stability. Section 1 includes a discussion on choice of emulsifying agents while Section 3 includes a detailed discussion of the HLB system. Careful attention has been given to minimizing repetition in such instances.

The first three sections cover about 217 pages of the text, while the latter two sections are more theoretical and quantitative, occupying about 260 pages of the text. The section on rheology is rather unique in its approach to rheological properties. Much of the discussion is based on structural effects within the emulsion, not merely on measurement data.

Each section of the text is well documented and contains sufficient breadth and depth to maintain the interest of a broad cross-section of readers.

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Drugs Affecting the Central Nervous System. Vol. 2 of the Medicinal Research Series. Edited by ALFRED BURGER. Marcel Dekker, Inc., 95 Madison Ave., New York, NY 10016, 1968. xv + 437 pp. 16 × 24 cm. Price \$19.75.

This second volume of a series continues the structural approach to drugs affecting the central nervous system. Eight chapters cover the general topics of narcosis, morphine-like analgesics, antidepressants, psychotomimetic agents, 1,4-benzodiazepine derivatives, centrally acting muscle relaxants, and substituted phenothiazines. The chapter on psychotomimetic agents by Albert Hofmann is of considerable interest. It covers not only his personal discovery of the effects of LSD, but is an excellent review of the naturally occurring psychotomimetic drugs. As would be expected, the relationship between chemical structure and clinical action, value, or use is not a major contribution of this

volume. There is evidence that the familiar non-agreements as to the meaning of words such as tranquilizer, relaxant, antidepressant are present between the various authors. This, however, should not detract from the main value of the series: the presentation in one place of large numbers of chemically related compounds with many of their comparative pharmacologic effects. The chapter on morphine-like analgesics is outstanding. The chemical anatomy of the many compounds is clearly described. There is a precise definition of the meaning of "morphine-like action." There is no attempt made to describe the morphine-like compounds clinically. This volume, like the first, is recommended for all serious students of pharmacology and pharmaceutical chemistry.

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Characterisation and Manipulation of Powders.

The Pharmaceutical Press, 17 Bloomsbury Square, London, W.C.1., England, 1967. viii + 180 pp. 14 × 22 cm. Price 50s. (1s. 6d. p/p).

This book is a copy of the handbook prepared for a one-week postgraduate course in Powder Technology. The course was organized by the Pharmaceutical Society of Great Britain and directed by Professor E. Shotten of the School of Pharmacy, University of London in April 1966. The book contains outlines of the lectures given by ten recognized authorities in the field of powder technology, plus 37 experiments and three demonstrations. The experiments and demonstrations were written by thirteen scientists, most of whom are well-known in the pharmaceutical field.

The book is intended to be a practical manual for industrial pharmacists and others who are interested in the characterization and manipulation of powders. The lectures and experiments cover a broad area including particle size analysis, surface area measurement, particle cohesion, size reduction, mixing, granulation, fluidization, classification, crystallization, etc. Unfortunately, as noted in its Introduction, this book does lack balance, polish, and accurate syntax. The reader will find some of the experiments confusing, especially those describing operation of apparatus which is not named or described. There is also a lack of continuity which is not helped by placing the lecture outlines in the back of the book. The brevity of the course and size of the book also results in the omission of much important technology.

Despite these shortcomings, this book does provide an assemblage of information which should be useful to teachers and other workers in this field.

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