Book Reviews

Organophosphorus Stereochemistry. Edited by William E. McEwen and K. Darrell Berlin. Halsted Press, New York, N.Y. 1975. Part I, xviii + 385 pp, 17 × 25 cm, $30.00. Part II, xv + 319 pp, 17 × 25 cm, $28.00.

These volumes comprise books 3 and 4 in the series "Benchmark Papers in Organic Chemistry", whose aim is to collect landmark papers in areas of intense current chemical interest. The editors' intent is to retain the flavor of original research reports in presenting a review of organophosphorus stereochemistry up to the limits of contemporary knowledge. These volumes appear to cover the literature through 1973, but some references to 1974 work will be found, for example, in the preface to Part 2.

Part 1 consists of four sections: Historical Perspectives, which covers work from McEwen's discovery of optically active phosphonium salts to recognition of the pseudorotation phenomenon; Pseudo-Rotation, which thoroughly reviews this pivotal topic, as well as turnstile rotation; Phosphines and Phosphorus(III) Compounds; and Phosphonium Salts and Phosphine Oxides. The last section introduces the useful Desargues–Levi graphic device for predicting the stereochemical outcome of reactions involving pentavalent intermediates. Each section is introduced by most useful editors' comments regarding the significance of the work, as well as references to papers other than those reproduced. In most cases, a review article leads off each section, and a number of landmark research papers and communications follow.

Part 2 has three sections: The Wittig Reaction, which consists of a single review article from 1970; Phosphoryl Compounds; and Phosphoranes. In the latter two sections, biochemical aspects of phosphorus stereochemistry are illustrated. At the end of each part are extensive (84 pp) tables of most known optically active phosphorus compounds.

The editors have provided an excellent selection of papers and review articles, as well as useful comments of their own, from which one can effectively review organophosphorus stereochemistry, as well as the attendant reactions and mechanisms, through 1973. Some material on pseudorotation in Part 2 appears redundant; otherwise, the selection of material has been accomplished with remarkable economy and completeness. Readability is variable, since necessary photoreduction of large-format journals makes the type in these sections quite small. These are books medicinal chemists engaged in organophosphorus chemistry will certainly want to examine. As with many recent books, price is a serious obstacle to private ownership. In this case, it appears considerable economy could have been achieved by setting the tables in smaller type and combining Parts 1 and 2 into one volume.

Department of Medicinal Chemistry **Robert A. Wiley**
The University of Kansas
Lawrence, Kansas 66044

Chelates in Analytical Chemistry. Volume 5. Edited by H. A. Flaschka and A. J. Barnard, Jr. Marcel Dekker, New York and Basel. 1976. xiii + 328 pp.

The fifth volume in this useful series contains separate chapters devoted to two important classes of chromogenic agents.

In the first chapter, E. Bermejo-Martinez reviews the uses of EDTA and other aminopolycarboxylates as chromogenic reagents. This well-written contribution is notable in that it not only contains detailed experimental procedures for the determination of many elements but is also well illustrated and referenced. An indication of the care which has been taken in the preparation of this chapter is provided by a procedure for the determination of oxygen in demineralized water on p 113; the author even describes how to prepare standards and overcome the nonlinearity of the calibration curve below 4 mg of O_2/ml. Dr. Bermejo-Martinez is to be congratulated on providing a very useful and up-to-date compendium of methods in spectrophotometric determinations with aminopolycarboxylates.

B. W. Budesinsky and K. E. Curtis have taken on the formidable task of reviewing the use of o-dihydroxy compounds as color-forming agents in inorganic analysis. This chapter differs from the first in providing a relatively uncritical source to the original literature rather than in giving detailed experimental procedures. The discussion is sometimes confusing to the practicioner because it is not always clear as to whether a particular metal–ligand combination is a useful one for analysis. For example, on p 170, where the authors are reviewing the determination of vanadium with o-dihydroxybenzene, it is pointed out that although some workers have used this particular combination for analysis, one particular reference does not recommend its use. In this reviewer's opinion, a more restricted and critical approach (like that of Chapter 1 of this Volume) might have been of greater immediate benefit to the practicing analyst. Table I of Chapter 2 (pp 260–273) does, however, briefly summarize chromogenic procedures for 29 elements, but here again the detail of Chapter 1 is missing.

The volume is attractively produced from camera-ready copy and is well referenced and indexed. It will make a useful addition in the analyst's library, although because of its specialized coverage it is not likely to find its way to the shelves of individuals.

Department of Chemistry **Geoffrey Davies**
Northeastern University
Boston, Massachusetts 02115

Chemical and Molecular Basis of Nerve Activity. Second Edition. Edited by David Nachmansohn and Eberhard Neumann. Academic Press, New York, N.Y. 1975. xvii + 403 pp. $19.50.

The revised edition of "Chemical and Molecular Basis of Nerve Activity", by Drs. David Nachmansohn and Eberhard Neumann is a comprehensive treatise on cholinergic neurotransmission. Unlike the first edition, published in 1959, this text encompasses a broader spectrum on the nature of nerve activity and its relationship to acetylcholine. The book is divided into three main sections, with the first resembling the original text in scope. This portion is primarily concerned with biochemical and molecular findings of the cholinergic system. A basic introduction to nerve transmission is presented including a section on methodology and difficulties encountered in studing the physicochemical changes underlying the process of transmission. This is followed by a substantial section on the properties and functions of acetylcholinesterase and its significance in conducting tissue. The mechanisms involved with the organophosphorus inhibitors and consequent reactivators are also discussed in detail. Unfortunately, the role of cholineacetyltransferase is presented in a very terse chapter. The nature of the relationship between acetylcholine and the induced conformational changes in the receptor triggering the permeability alterations accompanying nerve activity is elucidated, and a reevaluation of the original neurohumoral transmitter theory is presented.

The first supplement includes recent progress on correlative data between acetylcholine and electrical excitability and focuses primarily on the biochemical role of acetylcholine and nerve activity. The properties and functions of proteins linked to the action of acetylcholine are integrated with nerve excitability.

The second supplement, presented by Dr. Neumann, is basically a mathematical treatise of nerve excitability. The integral molecular model of nerve activity is approached from a physicochemical aspect.

Generally speaking, this is a well-written text containing many new postulates concerning the role of the acetylcholine cycle in nerve transmission. The book is most applicable to investigators

in the area of neural activity and may be of interest to graduate and postgraduate students.

Department of Medicinal Chemistry and Pharmacology
College of Pharmacy and Allied Health Professions
Northeastern University
Boston, Massachusetts 02115
Lynn Wecker

Chemistry and Biology of Pteridines. Edited by Wolfgang Pfleiderer. Walter de Gruyter, Berlin/New York, N.Y. 1975. xvi + 949 pp. 18 × 24.5 cm. DM 190.00 ($73.00).

This book contains the proceedings of the 5th International Symposium on the "Chemistry and Biology of Pteridines", which was held in the University of Konstanz, West Germany, in 1975, and it can safely be said at the outset that no worker in the pteridine field can afford to be without it. Workers in this area are referred to in the preface as pteridinologists, and they form a closely knit group. Their common interest in pteridines, however, in no way restricts the scope of their research, for this is a highly interdisciplinary area, and papers on chemotherapy, enzymology, biochemistry, biosynthesis, and the chemistry and spectroscopy of pteridine compounds are all to be found in the book. Most of the papers report new research material which has not yet appeared anywhere else in print. The book, therefore, is of the first importance for any worker in the pteridine field, and the editor and publisher are to be congratulated for its prompt appearance after the symposium. The volume is a substantial one and is attractively produced in typescript rather than conventional print. Perhaps its only shortcoming is the lack of both a subject and an author index. There is a list of contents, together with a list of contributors in alphabetical order, but even the latter does not refer the reader to the page on which an author's contribution is to be found. However, it is recognized that the preparation of an index could have delayed publication, and this would have impaired the usefulness of the book, dealing as it does with new research results. For without doubt this volume is one of the most important publications for some time in the pteridine field, and it is essential reading for anyone who is interested, either directly or indirectly, chemically or biologically, in pteridines.

Department of Chemistry
Trinity College
Dublin 2, Ireland
Peter H. Boyle

Biochemical Fluorescence: Concepts. Volume I. Edited by Raymond F. Chen and Harold Edelhoch. Marcel Dekker, New York, N.Y. 1975. xi + 408 pp. $29.50.

This volume contains seven chapters. Chapter 1, "The Decay of Fluorescence Anistropy" (Philippe Wahl), discusses experimental details; theory of fluorescence anistropy; brownian depolarization; energy migration in general; and, more interestingly, energy migration in an array of chromophores distributed along a regular helix. Chapter 2, "Time Decay Fluorometry by Photon Counting" (Irvin Isenberg), focuses on instrumentation and analysis of data. It is an extremely well-written chapter by a very competent author and should be well appreciated by readers and workers interested in the field of fluorescence and its application to macromolecules. Chapter 3, "Fluorescence Polarization: Some Trends and Problems" (Izchak Z. Steinberg), outlines the theoretical implications of absorption and emission of circularly polarized light, vis-a-vis linear polarization of fluorescence and circularly polarized light as a source of information about emitting molecules in the excited state and as a diagnostic tool for the study of macromolecular conformation. In spite of all good intentions, the implications of CPL in the field of biochemical fluorescence are not clearly established in this chapter.

Chapter 4, "Polarized Excitation Energy Transfer" (Robert E. Dale and Josef Eisinger), is the largest chapter, consisting of 169 pages and containing a galaxy of figures and illustrations. Chapter 5, "The Measurement of Intramolecular Distances by Energy Transfer" (Peter W. Schiller), deals with the topics of increased acceptor fluorescence and analysis of acceptor fluorescence decay, as well as measurement of quantum yields or lifetimes of the donors. In my opinion this chapter is the weakest one in the volume and readers may find it somewhat out of step with the other reviews in the book. Chapter 6, "Fluorometric Kinetic Techniques: Chemical Relaxation and Stopped-Flow Technique" (Thomas M. Jovin), is a remarkable treatise on the theory and application of two increasingly important techniques in fluorescence and biophysics: the stopped-flow and temperature-jump techniques. Their application to binding equilibrium studies, to the equilibration of the bound state of either the dye or the enzyme to the macromolecular substrate, and especially to the analysis of intercalation reactions as applied to intercalating dyes bound to polynucleotides is well warranted in the future. Chapter 7, "Fluorescence Polarization Kinetic Studies of Macromolecular Reactions" (Stuart A. Levinson), the last chapter of the book, is a relatively short one. Mainly, it is restricted to the author's own work and is, therefore, limited in scope, providing the reader with a weak overall view of the subject.

Many contributors to this volume are experts in their fields and some have done a great job in bringing the highly complex and intricate aspects of fluorescence spectroscopy to a level where they can be applied to biological macromolecules in the field of biophysics. However, a great deal of this volume (I) had to be devoted to the theoretical calculations, definitions, and elucidations of the phenomenon, based on the results of mathematical equations. The book is intended for those readers who have already had some exposure to fluorescence spectroscopy and have a familiarity with its intricacies, together with a working knowledge of thermodynamics and molecular orbitals. Nonetheless, the volume is and will remain a significant contribution to the literature and a work of considerable interest to those who cherish the field.

Division of Medicinal Chemistry and Pharmacology
Sidney Farber Cancer Institute
Harvard Medical School
Boston, Massachusetts 02115
Sisir K. Sengupta