H. S. Gutowsky, Departments of Chemistry, Fordham University, New York, New York, University of Massachusetts, Amherst, Massachusetts, and University of Illinois, Urbana, Illinois.

On page 1251, in the fifth paragraph of the Experimental Section, the first sentence should begin as follows: If the reduction as described above is performed on an ammonium carbonate extract resulting from work-up of the Friedel–Crafts reaction of anisole with phthalic anhydride[31] and terminated after 7 hr, (4-methoxyphenyl)phthalide (72%, mp 117–118°) is obtained; . . . .

Heavy-Atom Solvent Effect on the Photoaddition of Acenaphthylene and Cyclopentadiene [*J. Amer. Chem. Soc.*, **93**, 2071 (1971)]. By B. F. Plummer* and D. M. Chihal, Trinity University, San Antonio, Texas 78212.

Due to an experimental error the product ratios reported in Table I for acetonitrile and cyclohexane are corrected respectively to (endo:exo:[2+2]): 0.66: 3.01:1 and 0.58:1.46:1. This does not change the major conclusions reached concerning the heavy-atom effect.

Oxidative Cleavage of Cobalt–Carbon Bonds in Organobis(dimethylglyoximato)cobalt Compounds [*J. Amer. Chem. Soc.*, **94,** 659 (1972)]. By Peter Abley, Edward R. Dockal, and Jack Halpern,* Department of Chemistry, The University of Chicago, Chicago, Illinois 60637.

The structure of compound **4** (eq 6 and footnote 11) was incorrectly assigned. The correct formulation of this compound is almost certainly $RON{=}C(CH_3)C(CH_3){=}NOH$, *i.e.*, the ether of dimethylglyoxime. S. N. Anderson, D. H. Ballard, and M. D. Johnson [*J. Chem. Soc., Perkin Trans. 2*, 311 (1972)] have recently reported that this compound is also one of the products of the reactions of halogens with benzylcobaloxime in acetic acid.

Reaction of Tetrasulfur Tetranitride with Strained Olefins [*J. Amer. Chem. Soc.*, **94,** 1550 (1972)]. By Max R. Brinkman and Christopher W. Allen,* Department of Chemistry, University of Vermont, Burlington, Vermont 05401.

Reference 5 should read: M. Becke-Goehring and D. Schläfer, *Z. Anorg. Allg. Chem.*, **356,** 234 (1968).

Axial Pseudoasymmetry in Sulfenamides. A Method for Assignment of Configuration to *meso* and *dl* Secondary Amines [*J. Amer. Chem. Soc.*, **94,** 2533 (1972)]. By Daniel Kost and Morton Raban,* Department of Chemistry, Wayne State University, Detroit, Michigan 48202.

On page 2533, column 2, the tenth line down from the figure should read: for interconversion of the *r* and *s meso* isomers.

Base-Catalyzed Nucleophilic Substitutions at Pentacoordinated Phosphorus [*J. Amer. Chem. Soc.*, **94,** 3531 (1972)]. By Fausto Ramirez,* Gordon V. Loewengart, Elefteria A. Tsolis, and Koa Tasaka, Department of Chemistry, State University of New York at Stony Brook, Stony Brook, New York 11790.

On page 3533, column 2, in the first and second lines fluoro alcohol should read fluoroalkoxy ligand. In the caption to Figure 1, at the end of line 9 $(CH_3)_2$ should read $(CF_3)_2$.

Emission Properties of Aromatic Amines in Solution. Phenoxazine System [*J. Amer. Chem Soc.*, **94,** 3755 (1972)]. By J. Robert Huber* and W. W. Mantulin, Department of Chemistry, Northeastern University, Boston, Massachusetts 02115.

On page 3759, column 2, lines 1–8 *from the bottom* should read: . . . . . B_1 in C_{2v} symmetry becomes A'' in C_s.[25] ISC between A'' states, involving the $H_{so}(R_x)$, is allowed. (N–O axis corresponds to the *z* direction, plane of symmetry is $\sigma(zy)$). . . . . Therefore, polarization of the phosphorescence is along the *x* axis.

These corrections have no effect on the conclusion.

*Book Reviews**

Annual Reports in Organic Synthesis—1970. Edited by John McMurry and R. Bryan Miller (University of California). Academic Press, New York and London. 1971. xvi + 339 pp. $7.50.

The seemingly endless expansion of the amount of published research has produced a variety of attempts to aid the individual chemist to keep track of what is new in his field. Some are designed to be primarily alerting devices, and others are meant to be permanent records with easy retrieval characteristics. The present volume is the first of a series on organic synthesis and attempts to satisfy both needs. Alerting is accomplished by rapid publication and retrieval by organization. Easy scanning is aided by relying almost entirely on structural formulas to convey information.

The editors have been reasonably successful in their aims, for material available to them through March 1971 has been incorporated in a book that appeared within the same calendar year. The organization is a natural one and is convenient to use. It involves subdivision into seven classes: Carbon–Carbon Bond Forming Reactions; Oxidations; Reductions; Synthesis of Heterocyclics; Protecting Groups; Useful Functional Group or Multistep Syntheses, and Completely Miscellaneous Reactions.

There are, of course, other books and serial publications in organic synthesis, a fact that the editors freely acknowledge; "Theilheimer" is perhaps the most similar. The advantage of the present series is the much lower price (achieved at the expense of some of the elaborateness of coverage of Theilheimer), which makes it feasible for the individual chemist to purchase it. It seems to fill a need.

N-Benzoylphenylhydroxylamine and Its Analogues. By A. K. Majumdar (Jadavpur University). Pergamon Press, Oxford. 1972. x + 211 pp. $20.00.

This is a monograph on the preparation of a class of analytical reagents and their application to separation and determination of

---

* Unsigned book reviews are by the Book Review Editor.

various metals by both spectrometric and classical techniques. Many specific laboratory procedures are described.

Encyclopedia of Industrial Chemical Analysis. Volume 15. Edited by F. D. Snell and L. S. Ettre. Wiley-Interscience, New York, N. Y. 1972. xv + 574 pp. $45.00 ($35.00 by subscription).

This latest volume of the series covers seventeen subjects, from Ion Exchange Resins to Mercaptans. The editors have made a point in this instance of departing from the usual restriction to industrial chemical products in order to include an 11-page article on identification and determination of LSD, a subject of much current importance that is not adequately treated elsewhere.

Fluorocarbon and Related Chemistry. Volume 1. Edited by R. E. Banks and M. G. Barlow (University of Manchester). The Chemical Society, London. 1971. viii + 307 pp. £7.00.

The series "Specialist Periodical Reports" has been expanded to include fluorocarbons, which are planned to be reviewed biennially, beginning with this volume. The literature published during 1969 and 1970 is reviewed in six chapters, which includes not only fluorocarbons, but perfluorinated carbonyl compounds and organometallic compounds as well. Chapter 6, devoted to ^{19}F nmr, will have a broader appeal. In addition to the many references given in the body of the book, there is a useful appendix listing books and major reviews. There is an author index, but, strangely, no subject index.

Fundamentals of College Chemistry. Third Edition. By J. H. Wood, C. W. Keenan, and W. E. Bull (University of Tennessee). Harper and Row, New York, N. Y. 1972. ix + 563 pp. $11.95.

This is a textbook for an introductory college course for students interested in chemistry "as a part of his general cultural education," and is not designed for majors in chemistry. About one-sixth of the text is devoted to organic and biological chemistry.

Modern Synthetic Reactions. Second Edition. By Herbert O. House (Georgia Institute of Technology). W. A. Benjamin, Inc., Menlo Park, Calif. 1972. vi + 856 pp. $16.95.

This has not been an easy book to review for it has a high susceptibility to being borrowed. Its title as "Second Edition" is a modest understatement, for it is an entirely new book, three times the size of its predecessor. Although it is a reference book, the publishers have evidently (and correctly) anticipated that it will have sales at the level of a textbook, for the price of 2¢ per page is uncommonly low.

There are eleven chapters, of which four are devoted to reductions, three to oxidations, and one each to halogenation, alkylation at carbon, acylation at carbon, and the aldol condensation. The book is thus not intended to be all inclusive, but the subjects addressed are covered comprehensively and with a most satisfying richness of critical detail. The references, which are almost overabundant, are arranged at the foot of each page, which makes for greater convenience. The citations are to both the review literature and original research papers, another valuable feature.

One small criticism is that it is not always easy to find where a given subject is treated, because there is no author index, and reference to well-known reactions by names seems to have been studiously avoided, even in the index. For example, the Moffatt oxidation cannot be found under that title.

Surely every graduate student in organic chemistry will want to own a copy, and most others engaged in organic synthesis will find it a valuable aid, indeed.

Nomenclature of Inorganic Chemistry. 2nd Edition (IUPAC). Butterworths, London. 1972. xi + 110 pp. $8.25.

This is the "Red Book," containing the IUPAC Definitive Rules issued by the Commission on the Nomenclature of Inorganic Chemistry, 1970.

The work presented in this book is the latest effort to standardize the nomenclature necessary for communication, in the face of ever more complex structures. Not surprisingly, the largest section is on coordination compounds. The section on boron compounds is curtailed, because the nomenclature of the many organoboron derivatives will be covered in another work to be published. It is easy to lose sight of the tremendous amount of work that the Commission went through in wrestling with the many vexing problems, and not everyone will like every compromise that had to be adopted; the important fact is that an internationally cooperative effort has borne fruit which, although it lacks the glamor of the results of laboratory research, is essential to the well-being of the science of chemistry. There are an index and many convenient tables to make quick checking easy; there should be no excuse for sloppy nomenclature.

Organic Spectral Problems. By John R. Dyer (Georgia Institute of Technology). Prentice-Hall, Inc., Englewood Cliffs, N. J. 1972. x + 207 pp. $5.95.

A curious feature of the English language is that the adjective "spectral" may refer either to spectres or spectra; this paperbound book deals with the latter although a companion volume on the former could be fascinating. This book is designed to be a workbook for advanced undergraduate and beginning graduate students to learn how to interpret spectra by doing problems. For 95 compounds, ir, nmr, and mass spectra are illustrated, and uv and mass spectra are given numerically. It is good to see that the ir spectra were taken on an instrument linear in wave number, and that nmr integration traces are shown. The problems are divided into three groups of different degrees of difficulty. The first four problems of each of the first two groups are worked out for the student with a description of the intellectual process followed; outside of these, the solutions are given only in the form of references that must be looked up. This sort of book is a most useful aid to teaching.

Physical Methods in Heterocyclic Chemistry. Volume IV. Edited by A. R. Katritzky (University of East Anglia). Academic Press, New York, N. Y. 1971. xiv + 480 pp. $32.00.

In this penultimate volume, the subjects covered in the first two volumes, published in 1963, are brought up to date to 1970. There are six contributed chapters, which cover dielectric absorption, nuclear quadrupole coupling constants, heteroaromatic reactivity, nmr, dipole moments, and infrared spectroscopy. The nmr and ir chapters are the longest and will probably be used the most. A large amount of information is made easily available by the generous use of tables, and, of course, the bibliographies are extensive. There are author and subject indexes to this volume, but a comprehensive index to the complete series is promised for Volume V.

Physical Science. 3rd Edition. By Verne H. Booth and Mortimer L. Bloom (Brooklyn College). Macmillan, New York, N. Y. 1972. xi + 705 pp. $11.95.

This is a textbook for an introductory course in general physical science which presupposes elementary algebra as background. About one-fifth of the text is devoted to chemistry.

Scientific and Technical Libraries. Their Organization and Administration. Second Edition. By Lucille F. Strauss, Irene M. Shreve, and Alberta L. Brown. John Wiley, New York, N. Y. 1972. x + 450 pp. $14.95.

Institutions contemplating the formation of a scientific research library should find this book of much help, for it gives practical information on costs, planning and operation, as well as basic reference and subject bibliographies for the various physical and biological sciences. The bibliography for chemistry is over six pages and appears to be reasonably up to date and to have been compiled with professional expertise.

Biodegradabilitatea Detergentilor. By Lydia-Maria Vaicum. Editura Academiei Republicii Socialiste Romania, Bucharest. 1971. 253 pp. L. 16.00.

This paperbound monograph on detergents and their relation to pollution contains a large amount of tabulated information and a bibliography of 212 references, many of them to less readily accessible East-block sources; it attests to the fact that even pollution cannot be claimed as a peculiarly Western attribute.

Introducere in Chimia Fizica a Starii Vitroase. By P. Baltă and E. Baltă. Editura Academiei Republicii Socialiste Romania, Bucharest. 1971. 240 pp. L. 15.50.

This is a selective monograph on the nature of the glassy state according to present understanding. Although very few of our readers are believed to be chemical engineers familiar with Romanian, we publish this review to call attention to the bibliography as a source of references to literature not easily found here.

Preparative Acetylenic Chemistry. By L. Brandsma (University of Utrecht). Elsevier Publishing Co., Amsterdam, London, New York. 1971. x + 207 pp. $19.50.

This book is recommended not only as an indispensable manual for the acetylene chemist, but also as a valuable source of practical knowledge for the beginning or experienced organic chemist in other fields. Based on the author's personal laboratory experience, the experimental procedures (over 200) are very completely described and the various apparatus clearly illustrated so that even the inexperienced acetylene chemist should be able to reproduce the author's results by observing diligent attention to detail.

Chapter I is entitled General Practical Instructions. The author states that an important aim of this book is to familiarize organic chemists with a number of unconventional but simple experimental methods. The simplicity of the apparatus used can be an asset for rapid work-up of unstable compounds. The many helpful comments on general laboratory technics in this chapter and throughout the book should be extremely useful for the organic experimentalist. The author is quite generous in sharing with the reader these many tricks of the trade which he has accumulated during his years of active laboratory research.

He first discusses practical considerations involved in using liquid ammonia as well as other more common reaction solvents. Included in this section is some useful information on methods of obtaining very dry solvents. He then considers the factors determining the choice of extraction solvents, *i.e.*, relative boiling points of product and solvent, stability of product, etc. A third section entitled "Practical Hints" deals with such topics as the safe storage, handling, and disposal of alkali metals; types of cooling baths for exothermic reactions; foaming problems in liquid ammonia; difficult separation of layers; drying extracts with various desiccants; and distillations.

The content of most of the remaining chapters is evident from their titles: *Chapter II*, Preparation of Metal Acetylides; *Chapter III*, Alkylation on Acetylenic Carbon and Some Related Reactions; *Chapter IV*, α-Hydroxylation, Carboxylation, and Acylation on Acetylenic Carbon; *Chapter V*, Direct Introduction of Hetero-Substituents (syntheses of acetylenic Si, Sn, N, P, S, Se, Te, Cl, Br, and I compounds are given); *Chapter VI*, Preparation of Acetylenes by Elimination Reactions; *Chapter VII*, Base-Induced Migration of the Triple Bond; *Chapter VIII*, Miscellaneous Preparations (the author gives several experimental procedures for preparing each of the following additional acetylenic types: (1) hydrocarbons (substituted butadiynes); (2) halides and tosylates; (3) amines, acid amides, and cyanides; (4) alcohols; (5) aldehydes, ketones, and carboxylic acids; (6) ethers; (7) thiols and sulfides; in addition, he lists several unchecked literature preparations with their references and appropriate comments); *Chapter IX*, Starting Compounds.

The author is obviously concerned with safety, as is evidenced by his many words of caution and warnings of potential danger (even intentionally excluding the preparation of fluoroalkynes for this reason). However, one experimental detail which might have been of general interest is what special precautions, if any, are ordinarily taken to protect the chemist from personal injury in those many experiments involving potentially explosive reactions or products. One assumes that a plastic or safety-glass shield is adequate in such cases.

This book is recommended not only as a must for anyone working with acetylenic compounds but also as a valuable addition to the library of any experimental organic chemist.

W. E. Behnke, *Parke, Davis and Company*

Chemical Kinetics. By R. W. Weston, Jr., and H. A. Schwarz (Brookhaven National Laboratory). Prentice-Hall, Inc., Englewood Cliffs, N. J. 1972. xii + 274 pp.

Weston and Schwarz have written an excellent graduate text on kinetics. The emphasis is on theory rather than on reaction mechanisms: the heart of the book is comprised of four chapters on the theory of gas reaction rates and two on solution reactions, sandwiched between a short introductory chapter on rate laws and a concluding chapter giving detailed discussions of the mechanisms of two complex chemical systems, α-chymotrypsin catalysis and the upper atmosphere.

The theory of bimolecular gas reactions is built upon a concise but clear description of the forces between atoms, molecules, and ions. The implications of these forces for bimolecular scattering processes are then developed *in extenso* for elastic, inelastic, and reactive collisions. Combining these results with kinetic theory of gases equations (which are summarized in an appendix rather than derived in the text) yields the collision theory of bimolecular gas reactions. A short exposition of activated complex theory is included. The RRK theory of unimolecular gas reactions is derived in the traditional way, then amended to take account of recent developments. The theory of solution reaction rates is built upon diffusion theory, with detailed accounting for ionic strength effects. Linear free energy correlations are discussed in detail, using as theoretical basis the free energy of activation concept and conventional procedures.

Instructors of kinetics courses should definitely consider this textbook as an alternative to the more classical choices now available, particularly if they wish to introduce their classes to scattering theory.

W. C. Gardiner, Jr., *University of Texas at Austin*

Water and Aqueous Solutions. Edited by R. A. Horne (JBF Scientific Corp.). Wiley-Interscience, New York, N. Y. 1972. viii + 837 pp.

This compilation of 19 papers on the structure and properties of water constitutes a substantial sourcebook for physical and biological scientists. The characteristics of the water molecule are relevant to the interpretation of many natural phenomena, in both geology and biology. Researchers in these fields often will find in this volume novel, if not rewarding, entries to those problems involved with the behavior of water.

Horne submits that an appreciation of and insights into the properties of water may be found in comparisons with those of ice and of nonaqueous electrolyte solutions. Thus, the first four chapters consider such systems and effectively substantiate this argument. Since nearly all of "real world" chemistry involves electrolyte solutions, it is sometimes useful to use pure water and fused salts as end members. The subsequent chapter provides a baseline for such a consideration with a treatment of fused salts as liquids. There follow two chapters illustrating the applications of water chemistry to oceanic and life processes, perhaps the least adequate presentations in the volume.

The strengths and weaknesses of "mixture" and "continuum" models of water are assessed in three chapters. These treatments are adequate and lucid; they provide a most important background for the physical-chemical properties of water, covered in the second half of the book. There is quite a dividend in an up-to-date compilation of partial molal volumes of electrolytes at infinite dilution, prepared by Frank Millero of the University of Miami. The hydration of ions occupies a prominent role in several of the final chapters, with a rather unusual concept in one of them: an interpretation of ionic hydration in terms of residence times of the water molecule rather than the hydration numbers.

The coverage, depth, and clarity of the volume merit high marks. The indexing for a compilation of this type is exceptionally well done. For the research scientist involved with water chemistry, this book can be a most useful guide and reference.

E. Goldberg, *Scripps Institute of Oceanography*

Symmetry in Coordination Chemistry. By John P. Fackler, Jr. (Case Western Reserve University). Academic Press, Inc., New York, N. Y. 1971. xi + 139 pp. $7.95 ($4.95 paperback).

Whenever an attempt is made to draw upon a knowledge of several topics and to apply this knowledge toward understanding a field currently relevant in research, the result is either a ponderous volume or some sort of compromise between background material and its application

The author of this book selects the latter approach in his attempt to apply a knowledge of quantum mechanics, quantum chemistry, and group theory toward an understanding of the symmetry, spectroscopy, and chemistry of transition metal complexes. The choices made by the author in this compromise automatically bias his work toward one group of readers or another.

In the present case the author assumes that the reader has a background in quantum mechanics and quantum chemistry comparable to the usual graduate level courses. Group theory is discussed at a level a bit more detailed than that necessary for a quick review, yet too sketchy to allow one unacquainted with group theory to apply it to transition metal chemistry.

Applications of quantum and group theoretical concepts to problems of transition metal complexes are given in a form which is logical in outline, terse in many explanations, and useful in terms of references, tables, and diagrams.

The result makes this book worthwhile for that individual who needs to acquire a working knowledge of the chemistry or spectroscopy of transition metal complexes and who is willing to study carefully the reference material cited by the author.

Thomas E. Gunter, *University of Rochester*
School of Medicine and Dentistry