Overlooked [*J. Am. Chem. Soc.*, **99**, 6280 (1977)]. By VALENTIN RAUTENSTRAUCH* and MICHEL GEOFFROY, Research Laboratories, Firmenich SA, 1211 Genève 8, and the Département de Chimie Physique, Université de Genève, 1211 Genève 4, Switzerland.

On page 6282, column 1, line 26, "large.^{13a}" should read "large.^{12a}". On page 6283, column 1, line 6, "**4**-*6*-d_2/**4**-*1*-*d*-*6*-d_2[19]" should read "**4**-*6*-d_2/**4**-*1*-*d*-*6*-d_2"; column 2, line 53, "**3**-*6*-d_1" should read "**3**-*6*-*d*".

On page 6284, column 1, line 5, the sentence should read: ". . . we indeed find less of the pinacols . . ."; Table II, column 5, should read "50, 50, 30, 30, 50"; footnote *a*, "Runs 27–29" should read "Runs 27, 28, 31", and "runs 30, 31" should read "runs 29, 30".

Peptide Hydrogen Bonding. Conformation Dependence of the Carbonyl Carbon-13 Nuclear Magnetic Resonance Chemical Shifts in Ferrichrome. A Study by ^{13}C-{^{15}N} Fourier Double Resonance Spectroscopy [*J. Am. Chem. Soc.*, **99**, 6846 (1977)]. By MIGUEL LLINÁS,* DONALD M. WILSON, and MELVIN P. KLEIN, Laboratory of Chemical Biodynamics (Lawrence Berkeley Laboratory) and the Department of Chemistry, University of California, Berkeley, California.

On page 6848, column 2, second paragraph, line 9, change Orn^2 to Orn^1; in line 13, change Orn^2 to Orn^1; and in line 14 change Orn^2 to Orn^1 and Orn^1 to Gly^3. The sentences should read:

" . . . It should be noticed that the Orn^1 and Gly^2 $^{13}C{=}O$ resonances, which are unresolved in Me_2O, shift exactly the same upon going to TFE exhibiting in this solvent also identical chemical shifts (Figure 3). This is of interest because while both the Orn^1 and Gly^2 carbonyls are exposed, their linked NH's are buried and protected in case of Orn^1 (Gly^3 NH) but external and solvated in case of Gly^2 (Gly^1 NH) which indicates . . . ".

*Book Reviews**

Chemistry of Nonaqueous Solvents. Volume 4. Edited by J. J. LAGOWSKI. Academic Press, New York, N.Y. 1976. xiv + 311 pp. $31.50.

This volume, subtitled "Solution Phenomena and Aprotic Solvents", complements parts of the first three volumes. Three of its seven chapters are devoted to general phenomena: conductivity, hydrogen bonding, and redox systems. The others review in detail the following solvent systems: tetramethylurea, inorganic acid chlorides with special reference to antimony trichloride, cyclic carbonates, and sulfolane. The chapters are contributed by an international selection of chemists. Large amounts of tabulated data make this a particularly useful reference work for chemists of all kinds.

The Chemistry of Nonbenzenoid Aromatic Compounds. II. Edited by R. KREHER and T. H. DARMSTADT. Butterworths, London. 1975. v + 258 pp. No price.

This is a reprint of Volume 44, No. 4, *Pure and Applied Chemistry*, in hard-bound form, and contains the plenary lectures from a 1974 symposium on the title subject. As such, it has no preface, foreword, or index.

Les Colorants Synthetiques. By M. HEDAYATULLAH. Presses Universitaires de France, Paris. 1976. 166 pp. No price.

This paperbound volume is part of the series "Le Chimiste". In nine chapters, it treats color and electronic state, classification of dyes, raw materials and intermediates, and the main classes of dyes, including reactive dyes. The subjects are lightly reviewed, with very few references (mostly to books), as is appropriate to a work emphasizing breadth rather than depth.

Eukaryotic Cell Function and Growth Regulation by Intracellular Cyclic Nucleotides. Edited by J. E. DUMONT, B. L. BROWN, and N. J. MARSHALL. Plenum Press, New York, N.Y. 1976. xviii + 835 pp. $63.50.

This is a book of proceedings of a NATO Course held in Belgium in 1974. The affair drew chemists, biochemists, physicists, mathematicians, biologists, and physicians, a fact reflecting the scope of the papers, from fundamental to clinical. Most of the papers appear to be concerned with cyclic AMP. There is a minuscule index.

Introduction to Materials Science Engineering. By K. M. RALLS, T. H. COURTNEY, and J. WULFF. John Wiley & Sons, Inc., New York, N.Y. 1976. xv + 665 pp. $18.95.

This is a textbook for beginning engineering students which aims to teach the relationship between the properties of solid substances (ceramic, metallic, polymeric, etc.) to their internal structure and external environment. It assumes very little knowledge of elementary chemistry and physics, but moves rapidly into them, and reaches a level of moderate technological sophistication. Because it deals with such practical aspects of chemistry as diffusion, corrosion, elasticity, deformation, electrical conduction, magnetic and optical properties, etc., it provides an interesting complement to the conventional introductory chemistry program; in fact, the education of both chemists and premedical students could benefit by a better acquaintance with the outlook of a book of this sort.

Industrial Crystallization. Edited by J. W. MULLIN, Plenum Publishing Corp., New York, N.Y. 1976. x + 473 pp. $32.50.

The Sixth Industrial Crystallization Symposium was held in Czechoslovakia in 1975; for the first time, the Symposium papers have been collected in a book of proceedings. The 44 papers are classified into groups: Secondary Nucleation; Crystal Growth Kinetics; Crystal Habit Modification; Crystallizer Design; and Crystallizer Operation and Case Studies. The approach varies from fundamental to applied but is essentially oriented to chemical engineering. The book is produced from uniform typescript and includes an index which, albeit inadequate, is an improvement over many volumes of proceedings.

Localization and Delocalization in Quantum Chemistry. Volume II. Ionized and Excited States. Edited by O. CHALVET, R. DAUDEL, S. DINER, and J. P. MALRIEU. D. Reidel Publishing Co., Dordrecht, Holland, and Hingham, Mass. 1976. viii + 474 pp. $39.00.

This volume contains the Proceedings of an international seminar. There are 25 papers, with a strongly French flavor. They are grouped under four headings, concerned with localizability of electrons in ionized and excited states, calculation of wave functions, excitons and localization, and electron localization and chemical reactivity. The book is nicely typeset on glossy paper and includes an "index of names" and a useful subject index.

Marine Natural Products Chemistry. Edited by D. J. FAULKNER and W. H. FENICAL. Plenum Press, New York, N.Y. 1977. x + 433 pp. $42.50.

A NATO conference held in 1976 gave rise to this volume of proceedings. Its purpose was to bring together organic chemists, ecologists, biologists, and pharmacologists. The papers are a mixture of reports of original research and reviews. The 38 contributions are reproduced from typescript, with liberal use of structural formulas and tables; the bibliographies are extensive. There are two indexes: one on genus and species; one on other subjects. It is a particularly interesting volume for organic chemists.

* Unsigned book reviews are by the Book Review Editor.

Pesticide Chemistry 3. Edited by P. VARO. Butterworths, London. 1976. vi + 299 pp. $35.00.

"Selected specially invited lectures" given at the Third International Congress on Pesticide Chemistry, held at Helsinki in 1974, comprise the content of this volume. There are 22 of them, most of which are concerned with some aspect of the natural transport and fate of pesticides and their toxicology. Only two of the papers are concerned with production of pesticides: one on the design of anticholinesterases, and one on the future of pesticide development in industry. The book is well produced, and the papers are well provided with illustrations and references, but regrettably, there is no index.

Proceedings of the First Cleveland Symposium on Macromolecules. Structure and Properties of Biopolymers. Edited by A. G. WALTON. Elsevier Scientific Publishing Co., New York and Amsterdam. 1977. vii + 309 pp. $39.95.

The Symposium, held in 1976, brought together researchers in three areas: proteins and polypeptides, nucleic acids and polynucleotides, and polysaccharides. The invited lectures are grouped accordingly and served as a focuses for the contributed papers, which are not included in this volume but will appear in appropriate journals. The invited lectures are reviews of the respective fields with some new features from the lecturers' own work. Unfortunately, the reviews have been somewhat abbreviated for publication. This is a pity, for the value of a review as reference is in proportion to its length. The reviews are nevertheless substantial. The lack of an index is regrettable.

Proceedings of the 1976 Heat Transfer and Fluid Mechanics Institute. Edited by A. A. MCKILLOP, J. W. BAUGHN, and H. A. DWYER. Stanford University Press, Stanford, Calif. 1976. xiv + 526 pp. $29.50.

Thirty-six papers given at a conference held in June 1976 make up this volume. The sections on Thermal Convection and on Combustion would seem to hold the greatest interest for chemists, but the conference was essentially oriented toward chemical engineering. There is no index.

Spectres d'Absorption Ultraviolets de Composés Organiques Azotés et Corrélations Spectrochimiques. Volume 1. By P. GRAMMATICAKIS (CNRS). Technique et Documentation, 11 rue Lavoisier, 75008 Paris. 1977. 107 pp. Ff 120.

This is the first of a four-part annotated collection of UV spectra of organic nitrogen compounds, all of which have been obtained by the author under strictly comparable conditions. The spectra are given graphically, with several closely related compounds grouped in each figure. The figures begin with some indole and indolenine derivatives, and appear in chronological order of the author's researches (beginning in 1936) rather than in a structurally logical arrangement. They are not haphazard, however, for his researches have had a pattern to them. Access is made easy by an alphabetical index. There are 1250 spectra in the volume, with a total of 5000 promised. It will be in effect the essence of a lifetime research career.

The book is paperbound and is one of the more horrible examples of standardization in the metric system; it is $8\frac{1}{4} \times 11\frac{3}{4}$ in. and is incompatibly tall for common bookcases. The four volumes will require binding as a unit when complete for practical library use, but they cannot be trimmed, because some of the pages have very little margin at top or bottom.

Stereochemistry of Heterocyclic Compounds. Part 2: Oxygen; Sulfur; Mixed N, O, and S; and Phosphorus Heterocycles. By W. L. F. ARMAREGO (The Australian National University). Wiley/Interscience, New York, N.Y. 1977. xvii + 494 pp. $43.50.

A review of Part 1 of this work appeared here recently [*J. Am. Chem. Soc.*, **99**, 5841 (1977)] and should be consulted for a general description of its nature and purpose. Part 2 completes the work with a short introductory chapter and a chapter for each of the categories in the subtitle. The chapter on phosphorus heterocycles, a particularly complex and interesting subject, was contributed by M. J. Gallagher.

Providing structural formulas with stereochemical perspective is particularly arduous for compounds of the type discussed, and it must have been a temptation to be conservative in their use. However, they are gratifyingly numerous. The index is also good; it covers subjects and those authors whose names are mentioned in the text. Nomenclature, which can be very troublesome with complex heterocyclics, is handled well. There is, however, a curious indecisiveness about peroxy acids; on the same page, for example, can be found both "perbenzoic" and "peroxycamphoric". The book is an illuminating work, capable of stimulating much thought in those willing to dig into it.

Survey of Modern Industrial Chemistry. By GERHARD A. COOK (SUNY, Buffalo). Ann Arbor Science Publishers, Ann Arbor, Mich. 1975. vi + 297 pp. $16.50.

Industrial chemistry, which provides directly or indirectly the major justification for the pursuit of chemistry beyond the introductory level, has received declining emphasis in college chemistry instruction over the last several decades. Indeed, some textbooks almost totally ignore the subject, and students who later accept jobs in industry often find themselves with a very distorted perspective of the means by which they will earn their livelihoods. It is therefore gratifying when attempts are made to restore balance in the education approach. This book is such an attempt; it is intended as a text for a one-semester undergraduate course, assuming general chemistry and introductory organic chemistry as prerequisites.

This book begins with a section on the "business side of the chemical industry", proceeds to a chapter on elementary chemical engineering, and then takes up the important general considerations of pollution, energy, and water. The remaining two-thirds of the book is devoted to different types of chemical substances of commerical importance, both inorganic and organic. References are given throughout the text, mostly to articles in *Chemical and Engineering News*.

This book suffers from superficiality, in that insufficient detail is provided to generate a good appreciation for the subject. For example, under the manufacture of aniline, it is stated merely that "aniline is produced by the catalytic hydrogenation of nitrobenzene"; how much more informative this statement could have been made by the simple insertion of the adjectives "continuous, vapor-phase"! And under nitroparaffins, only the nitration of propane is mentioned, and for that, only 2-nitropropane is shown as a product. The vague phrase "a mixture of nitroparaffins is produced" gives no inkling of the significant fact that nitromethane and nitroethane are of major importance here. There also are some unnecessary transgressions against elementary principles of chemical structure and nomenclature, such as the apparently deliberate representation of sodium perchlorate with a covalently shared electron pair between sodium and oxygen, and the naming of tolylene diisocyanate as "toluene diisocyanate". Chemical reactions are treated incredibly naively in some instances, such as the attribution of the bleaching properties of hypochlorite to the reaction "$OCl^- \rightarrow Cl^- + O$".

The author is to be commended for recognizing an educational gap and atttempting to fill it, but the shortcomings are so substantial that one should be cautious about recommending the book to students.

Analytical Methods for Pesticides and Plant Growth Regulators. Volume VIII. Edited by G. ZWEIG and J. SHERMA. Academic Press, New York, N.Y. 1976. xiii + 510 pp. $46.50.

This volume begins with a chapter on government regulations, and another valuable chapter on "Analysis of Pheromones and Other Compounds Controlling Insect Behavior". The latter chapter, however, appears to be not at all concerned with *analysis* of pheromones, but only with their *determination*. A happier title would have been "Analysis for Pheromones . . .".

The major portion of the volume consists of 31 chapters, each treating the analytical chemistry of a single insecticide, fungicide, or herbicide, for each of which is given ancillary information on physical and biological properties and methods of synthesis, as well as a detailed review of methods of determination, including full experimental directions for a recommended method. This volume has its own index, with much detail.

Electrochemistry: The Past Thirty and the Next Thirty Years. Edited by H. BLOOM and F. GUTMANN. Plenum Press, New York, N.Y. 1977. xiv + 450 pp. $49.50.

An international symposium held in 1975 produced the 28 chapters and four addresses that make up this volume honoring J. O'M. Bockris. The papers were arranged in pairs, one reviewing the present status of the subject, the other projecting into the next 30 years. The papers have been polished and provided with extensive bibliographies so as to make this volume of more permanent reference value than the

usual volume of proceedings. Much information is given in tables, one of which is no less than nine pages long. The subjects range from the fundamental nature of electrode processes to applications in mineral processing, and include electro-organic chemistry and bioelectrochemistry. The book concludes with a substantial summarizing review by Bockris and a good index.

Electron and Photon Interactions with Atoms. Edited by H. KLEINPOPPEN and M. R. C. MCDOWELL. Plenum Press, New York, N.Y. 1976. xiii + 682 pp. $45.00.

The word "Festschrift" has quietly been absorbed into English from German to denote a commemorative volume of articles in honor of a distinguished investigator. This volume is a festschrift for Professor Ugo Fano, and the proceedings of an international symposium held in 1974. It contains exactly 57 papers on theoretical and experimental atomic physics, each provided with appropriate figures, tables, and references, and is completed with an index.

Energy Technology Handbook. Edited by D. M. CONSIDINE. McGraw-Hill Book Co., New York, N.Y. 1977. 1857 pp. $49.50.

This handbook, which may hold the record for the thickest volume received here, was prepared by a group of 130 specialists and presents basic data on availability, utilization, and future prospects of the major sources of energy: coal, gas, petroleum, chemical fuels (including biomass sources), water power, nuclear, solar (including wind), and geothermal energy. Only horsepower seems to have been neglected. The amount of information included is prodigious. The references are very few and are mostly the secondary sources; there is an annoying number of references to conference papers, which are at best difficultly accessible. An index of 123 pages makes it possible to find something without undue trouble.

Index of Reviews in Organic Chemistry. Second Cumulative Edition. 1976. By D. A. LEWIS and P. CHARNOCH. The Chemical Society, London. 1977. 308 pp. $13.00.

This useful venture began with a cumulative index in 1971, which was followed by supplements in 1972 and 1973, after which there was a hiatus. Now we have a volume which not only includes reviews published up to May 1976, but embodies the 1972 and 1973 supplements as well. The resulting longer time span makes the work even more useful.

Reviews are listed from books as well as periodicals, and the language, if other than English, is indicated. The entries are alphabetical, but under each letter of the alphabet, the entries are gathered into three groups: individual compounds or classes; name reactions; specific chemical processes or phenomena. After the index word or phrase are given the full title, if it is different, the authors, and the reference. This arrangement is easy to use, and the information obtained can be most helpful. Its large format, 8 × 11⅜ in., undoubtedly dictated by economy, is not so convenient.

Magnetohydrodynamic and Magnetohydrostatic Methods of Mineral Separation. By U. ANDRES. Wiley/Halsted, New York, N.Y. 1976. vii + 224 pp. $30.00.

Magnetohydrodynamic separation involves the action of an electrically conducting fluid in crossed magnetic and electric fields on suspended particles; magnetohydrostatics is an analogous process in which the fluid is paramagnetic or ferromagnetic as a result of a dissolved or dispersed component, and is subjected to an inhomogeneous magnetic field. Separation depends on differences in density, conductivity, or magnetic susceptibility. The principal application of the technique has been for beneficiation of minerals, as, for example, in removal of pyrite from coal.

This book appears to be largely an account of the author's researches since 1962. It treats both theory and practice and contains many photographs, diagrams, graphs, and tables. Five pages of unnumbered references are collected at the end of the book; they are heavily drawn from Russian sources.

This book has some peculiarities. The location or affiliation of the author is not disclosed. Although the book appears to be a translation of a Russian original, no statement about it appears. No index is provided.

Starch Production Technology. Edited by J. A. RADLEY. Applied Science Publishers, Barking, Essex. 1976. viii + 587 pp. $100.00.

Industrial Uses of Starch and its Derivatives. *Ibid.* vii + 26 pp. $40.00.

These two books are part of a trilogy on the applied chemistry of starch, the third member being "Examination and Analysis of Starch and Starch Products". The editor states that they "cater for the individual who has to translate the laboratory findings into the actual hardware of production . . . ." They are thus of primary interest to chemical engineers and to chemists who work with them. There is nevertheless much fundamental organic chemistry included.

The first, and larger, work contains 22 chapters, about half of which are contributed, and about half by the editor. The text is about equally divided between manufacture of starch from various sources, and chemical modification of starch into a surprising variety of chemicals. The editor states his belief that this area is of potentially very great importance, for starch derivatives may be able to replace nonrenewable petrochemical products.

The second work contains seven chapters, of which five are by the editor. Adhesives, foods, textiles, paper, pharmaceuticals, etc., are treated. Both works have extensive bibliographies, drawn not only from applied journals such as *Cereal Chemistry* and *Journal of the Textile Institute*, but also from the *Journal of the American Chemical Society* and other fundamental journals. Each has a comprehensive index.

Books Received

Astronomy: The Structure of the Universe. By W. J. KAUFMANN, III. Macmillan Co., New York, N.Y. 1977. xi + 491 pp. $12.95.

An introductory text, featuring some magnificent color photographs of the surfaces of the moon and Mars, and of other planets and nebulae.

The Pump Handbook. Edited by I. J. KARASSIK, W. C. KRUTSCH, W. H. FRASER, and J. P. MESSINA. McGraw-Hill, New York, N.Y. 1976. xvii + 1,102 pp. $34.50.

Of essentially engineering orientation.

Multicriteria Decision Making and Differential Games. Edited by G. LEITMANN. Plenum Press, New York, N.Y. 1976. xii + 461 pp. $49.50.

A selection of contributions to the *Journal of Optimization Theory and Applications.*

Physical Science: An Inquiry Approach. By J. MONROE and B. JACKSON. Canfield Press (Harper & Row), San Francisco, Calif. 1977. xvii + 605 pp. $14.95.

An introductory text on general science.

From Molasses to the Moon. By H. C. BARNES, U.S. Industrial Chemicals Co. (National Distillers Corp.), New York, N.Y. 1975. 106 pp. $?

A history of U.S. Industrial Chemicals Company.

Engineering Formulas. Second Edition. By KURT GIECK. McGraw-Hill Book Co., New York, N.Y. 1977. 384 pp. $9.95.

Now includes SI units.

Scientific Elite. Nobel Laureates in the United States. By HARRIET ZUCKERMAN. The Free Press/Macmillan Publishing Co., New York, N.Y. 1976. xv + 335 pp. $14.95.

A biographical study of Nobel prize winners in American science, based on in-depth interviews and written from a sociological standpoint.

Formation and Role of Excited States in Radiolysis. Edited by A. SINGH. Pergamon Press, Oxford, England. 1976. xiii + 282 pp. $30.00.

A special issue of the *International Journal for Radiation Physics and Chemistry* (Vol. 9, No. 1/2, 1976).

The Future of Science. 1975 Nobel Conference. Edited by T. C. L. ROBINSON. Wiley/Interscience, New York, N.Y. 1976. xi + 145 pp. $12.95.

Lectures by Glenn Seaborg, Polykarp Kusch, John C. Eccles, and Langdon Gilkey, with discussions by a group of 27 Nobel laureates and six theologians.

Geoscience Instrumentation. Edited by E. A. WOLFF and E. P. MERCANTI. Wiley/Interscience, New York, N.Y. 1974. xxvi + 819 pp. $39.50.

Technical Report Writing. 2nd Edition. B. JAMES W. SOUTHER and MYRON L. WHITE (University of Washington). Wiley/Interscience, New York, N.Y. 1977. viii + 93 pp. $9.95.

Cooling Tower Environment—1974. U.S. Energy Research and Development Administration, Washington, D.C. 1975. x + 638 pp. $?

Proceedings of a symposium held in 1974.

An Introduction to Computer Science and Technology. By TOM LOGSDON. Franklin Publishing Co., Palisade, N.J. 1974. 317 pp. $12.00.

Of Acceptable Risk. By WILLIAM W. LOWRANCE (Harvard University). William Kaufmann Inc., Los Altos, Calif. 1976. x + 180 pp. $8.95 cloth; $4.95 paper.

A critical discussion with case studies of safety risks vs. benefits in modern society; one chapter is devoted to DDT.

Food, Man, and Society. Edited by D. N. WALCHER, N. KRETCHMA, and H. L. BARNETT. Plenum Press, New York, N.Y. 1976. xi + 288 pp. $22.50.

Contains papers presented at the third meeting of the International Organization for the Study of Human Development, held in 1975.

Quality of the Environment and the Iron and Steel Industry. Commission of the European Communities. Pergamon Press, Oxford, England. 1977. viii + 841 pp. $60.00 (paperbound).

Proceedings of a conference held in Luxembourg in 1974.

Industrial Gas Cleaning. 2nd Edition. By W. STRAUSS (University of Melbourne). Pergamon Press, New York, N.Y. 1976. xxiii + 621 pp. $19.50 (paperbound).

A critical presentation of the science, technology, and state of the art of cleaning industrial waste gases with emphasis on control of atmospheric pollution.

Essentials of Padé Approximants. By GEORGE A. BAKER, JR. (Brookhaven National Laboratory). Academic Press, New York, N.Y. xi + 306 pp. $26.00.

A Padé approximant is the ratio of two polynomials constructed from the coefficients of the Taylor series expansion of a function.

The Theory of Grindability and the Comminution of Binary Mixtures. By K. REMENYI. Akademiai Kiado, Budapest. 1974. 144 pp. $9.00.

A comprehensive and comparative exposition of the authors theoretical and experimental research.

Vasodilators: Evaluation and Clinical Pharmacology. Edited by Y. W. CHO and R. D. ALLISON. Instrument Society of America, Pittsburgh, Pa. 1974. 226 pp. $10.00.

A collection of papers from the Louisiana State University Clinical Pharmacology Symposium on Evaluation of Peripheral Vasodilators, held in 1971.

Nutrition, Growth and Development. Edited by C. A. CANOSA. S. Karger AG, Basel (distributed in U.S.A. by Albert J. Phiebig, Inc., White Plains, N.Y.). 1974. x + 272 pp. $39.50.

This is Volume 14 in "Modern Problems in Pediatrics", and is the proceedings of an international symposium held in Valencia in 1973.

Introductory Texts on Chemistry Received

Chemistry, the Central Science. By THEODORE L. BROWN and H. EUGENE LEMAY, JR. Pentrice-Hall, Inc., N.J. 1977. xvi + 815 pp. $15.95.

Exercises in General, Organic and Biological Chemistry. Fourth Edition. By ARNE N. LANGSJOEN. Burgess Publishing Co., Minneapolis, Minn. 1977. xiv + 278 pp. $6.95.

General Chemistry. Second Edition. Principles and Modern Applications. By RALPH H. PETRUCCI. Macmillan Publishing Co., Inc., New York, N.Y. 1977. xx + 790 pp. $15.95.

Basic Chemistry. Second Edition. By WILLIAM S. SEESE and GUIDO H. DAUB. Prentice-Hall, Inc., N.J. 1977. xvi + 576 pp. $14.50.

Foundations of Chemistry. By JESSE S. BINFORD, JR. Macmillan Publishing Co., Inc., New York, N.Y. 1977. xiv + 334 pp.

Chemistry: Concepts and Problems. By CLIFFORD C. HOUK and RICHARD POST. John Wiley & Sons, Inc., New York, N.Y. 1977. xiii + 370 pp. $5.95.

Chemistry. By W. T. LIPPINCOTT, ALFRED B. GARRETT, and FRANK HENRY VERHOEK. John Wiley & Sons, Inc., New York, N.Y. 1977. xvi + 761 pp. $15.95.

Chemical Principles for the Life Sciences. By RALPH J. FESSENDEN and JOHN S. FESSENDEN. Allyn and Bacon, Boston, Mass. 1976. vii + 615 pp. $14.95.

Contemporary Chemistry. By JOHN E. HEARST and JAMES B. IFFT. W. H. Freeman and Co., San Francisco, Calif. 1976. xi + 753 pp. $14.95.

Chemistry for the Health Sciences. Third Edition. By GEORGE I. SACKHEIM and RONALD M. SCHULTZ. Macmillan Publishing Co., Inc., New York, N.Y., 1977. x + 534 pp. $12.95.

General Chemistry. Third Edition. By WENDELL H. SLABAUGH and THERAN D. PARSONS. John Wiley & Sons, Inc., New York, N.Y. 1976. xvii + 568 pp. $14.95.

Introduction to Chemistry. By JACK D. CUMMINS and MICHAEL A. WARTELL. John Wiley & Sons, Inc., New York, N.Y. 1975. ix + 323 pp. $11.95

Study Guide to accompany introduction to Chemistry. By JACK D. CUMMINS and MICHAEL A. WARTELL, John Wiley & Sons, Inc., New York, N.Y. 1975. 306 pp. $3.95

Laboratory Manual for Introduction to Chemistry. By JACK D. CUMMINS and MICHAEL A. WARTELL, John Wiley & Sons, Inc., New York, N.Y. 1975. viii + 110 pp. $4.50.

Physics of Rare Earth Solids. By K. N. R. TAYLOR (University of Durham) and M. I. DARBY (University of Salford). Chapman and Hall Ltd., London. 1972. xii + 308 pp. $23.75.

This book reviews a number of the more important aspects of rare earth physics. The electronic and magnetic properties of these elements are sufficiently unique to deserve such a separate treatment.

The first chapter deals with ionic properties with an emphasis on magnetic phenomena. The next several chapters cover the rare earth metals and their alloys, including treatments of structure, band structure, magnetic properties, and transport properties. The final section of the book is concerned with rare earth compounds with separate considerations of oxides, chalcogenides, pnictides, and intermetallic compounds. Each section is well referenced through 1970. This work will be of use to all solid-state chemists, physicists, or metallurgists who have an interest in this field.

Joseph W. Lauher, *State University of New York at Stony Brook*

Oxygen Transport to Tissue—II. Edited by JÜRGEN GROTE (University of Mainz), DANIEL RENEAU (Louisiana Tech University), and GERHARD THEWS (University of Mainz). Plenum Press, New York, N.Y. 1976. xxiii + 781. $49.50.

This volume, number 75 in the Advances in Experimental Medicine and Biology series, contains papers presented at the Second International Symposium on Oxygen Transport to Tissue held in Mainz, West Germany, March 1975. The research described at the conference ranges over a very broad subject area: from hemoglobin-oxygen interaction at the molecular level to pharmacological control of oxygen supply to the brain. The outstanding advantage of this approach is that it emphasizes the interrelationships between events at the molecular, subcellular, and cellular levels in complex biological systems. Such an integration is valuable to the researcher concentrating in day-to-day research on a specific aspect of the overall problem. The experimental methods used in these studies are, for the most part, conventional physiological techniques (e.g., ion selective electrodes, spectrophotometry, electron microscopy, radio isotopes); however, there is an excellent session on the measurement of oxygen concentration in biological samples as well as sessions on experimental and theoretical aspects of oxygen diffusion and transport in blood and tissue. Factors controlling blood oxygenation at the molecular level, for example, 2,3-diphosphoglycerate concentration, are explored in one session, and in the following set of papers the influence of fluctuating oxygen

concentration on mitochondrial respiration and P450 induction is assessed. Moving from the molecular to the systemic level, subsequent sessions are aimed at understanding oxygen supply to specific organs (e.g., the kidneys and the retina), to the central nervous system, and to the fetus in pregnant animals. Finally, two sessions are devoted to the interplay between oxygen supply, oxygen consumption, and metabolism (primarily glycolysis) in tumor tissue. The symposium and this resulting volume appear to have accomplished a desired goal: presenting the research worker in the field with an overall view of oxygen transport at the molecular, cellular, and systemic levels.

Gerald T. Babcock, *Michigan State University*

Protein Crystallography. By T. L. BLUNDELL (University of Sussex) and L. N. JOHNSON (University of Oxford). Academic Press, New York, N.Y. 1976. xvi + 565 pp. $42.

The time is still within recent memory when protein crystallographers enjoyed a rather lofty position among molecular biologists, from which they could practice their craft unconcerned by the possibility that outsiders to the field might not understand diffraction methods and Fourier syntheses, or indeed that they themselves might not understand gel electrophoresis. At least for this reviewer, that era has ended. For this reason, perhaps more than any other, publication of Blundell and Johnson's "Protein Crystallography" has been received by molecular biologists with nearly unanimous gratitude and admiration. The authors have achieved a lasting contribution to their field by creating an advanced monograph which effectively communicates to nonspecialists the essential methods, limitations, and capabilities of protein crystal structure determination, while at the same time providing active protein crystallographers with an indespensable and surprisingly complete reference volume.

It is a timely and fortunate blend. Protein crystallography has achieved considerable technical maturity, but it has yet to express its full contribution to carefully chosen biological problems. Several such problems are considered by the authors in the concluding chapter, together with their assessment of the actual and potential importance of accurate three-dimensional atomic models. Perusal of this and other chapters suggests that macromolecular structure determinations can and ought to become commonplace adjuncts to biochemical research. To this end, the authors have addressed themselves squarely to the needs of present and future investigators. They have emphasized differences between the analysis of macromolecular crystals and small molecule x-ray crystallography. Six of the book's 19 chapters describe chemical or computational methods that are unique to protein and nucleic acid crystal structure determination. These practical chapters draw extensively from current literature and incorporate many previously unpublished observations. Their overall effect is to present highly workable approaches to the vexing problems—preparation of suitable crystals and isomorphous replacement derivatives, and calculation of a satisfactory set of phase angles—which now loom as the chief hurdles to be met in sustaining the flow of new macromolecular structural studies.

Remarkably, the authors have made few compromises in presenting traditional crystallographic topics. Discussions of crystal symmetry, x-ray diffraction theory, intensity measurement, and data processing are terse, but sufficiently complete to provide motivated research students with the necessary background for carrying out their own structure determinations. Theoretical treatments are limited almost entirely to pertinent results and may frustrate the would-be specialist. However, for these readers there are extensive and authoritative references to the primary literature.

Excellent, brief introductions to the use of noncrystallographic symmetry, neutron diffraction and γ-ray resonance, and electron microscopy complement the discussion of structure-determination methods. These chapters suggest to the adventuresome reader those areas where future technological development may be most active, and remind the traditional crystallographer that there are novel ways to circumvent some of the limitations of x-ray diffraction methods.

The selection of illustrative material throughout the book reveals the authors' unusual sensitivity to the routine frustrations actually encountered in practice by anticipating technical obstacles and presenting details for one or more practical solutions. A refreshing originality apparent in the selection, organization, and presentation of theory testifies to the fact that both authors learned x-ray crystallography by doing it. They have found new and instructive ways to present mathematical and physical ideas which have made previous treatments by physicists seem so impenetrable. For example, calculation of the electron density by Fourier transform theory is illustrated first by a short description of the contouring process, and then graphically by an electron density map itself together with its molecular interpretation. These pedagogical features may endow the volume with considerable value as an instructional aid.

A direct, literate style made reading this comprehensive monograph both pleasant and enlightening.

C. W. Carter, Jr., *University of North Carolina at Chapel Hill*

Advances in Inorganic Chemistry and Radiochemistry. Volume 17. Edited by H. J. EMELÉUS and A. G. SHARPE (Cambridge University). Academic Press, New York, N.Y. 1975. vii + 402 pp. $35.00.

Volume 17 of "Advances in Inorganic Chemistry and Radiochemistry" is divided into seven chapters: (1) Inorganic Compounds Containing the Trifluoroacetate Group (by C. D. Garner and B. Hughes); (2) Homopolyatomic Cations of the Elements (by R. J. Gillespie and J. Passmore); (3) Use of Radio-Frequency Plasma in Chemical Synthesis (by S. M. L. Hamblya and B. G. Reuben); (4) Copper(I) Complexes (by F. H. Jardine); (5) Complexes of Open-Chain Tetradentate Ligands Containing Heavy Donor Atoms (by C. A. McAuliffe); (6) The Functional Approach to Ionization Phenomena in Solutions (by U. Mayer and V. Gutmann); and (7) Coordination Chemistry of the Cyanate, Thiocyanate, and Selenocyanate Ions (by A. H. Norbury).

The reporters are to be congratulated on their success in condensing the literature in these areas into organized reviews. This book should serve as a useful guide and reference source to those engaged in research in these areas.

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Block and Graft Copolymerization. Volume 2. Edited by R. J. CERESA (The Polytechnic of the South Bank, London). John Wiley & Sons, London. 1976. xvii + 402 pp. $45.00.

This book is the second of a two-volume series, the first of which was published in 1973. As noted in the foreword to this volume, some developments in polymer science are rapidly exploited after discovery. In the case of block and graft copolymers, much of the basic technology has been in parts of the literature for many years. Only recently, however, has this field expanded explosively. Indeed, one of the first to call attention to the remarkable properties which could be designed into a block copolymer was Sir Harry Melville with the system methyl methacrylate-butadiene, photoinitiated.

The first volume of this series contained nine chapters dealing principally with natural polymers. This second volume of four chapters is devoted to two classes of synthetic polymers: the polyols and systems with poly(vinyl chloride). In a field of polymer science in which so many developments are currently occurring, it is hoped that the editor and publisher will be encouraged to continue the series on block and graft copolymerization. The need for such a continuation is clear in this rapidly moving part of polymer chemistry in that so many of the most recent references is this book date from the early part of the 1970's.

While this second volume covers but two systems, these systems are covered thoroughly. It is unfortunate that in a first glance at this book, it is possible to miss a great deal of material covered in Chapter 3, "The Synthesis of Block and Graft Copolymers of Poly(vinyl chloride)" where, for example, copolymers of ethylene and vinyl acetate, or polyethylene or polypropylene are the base systems onto which vinyl chloride is grafted. The elegant cationic graft copolymerization chemistry of poly(vinyl chloride) could receive more attention.

The first two chapters are detailed reviews of the synthesis and applications of polyol surfactants of the poly(ethylene oxide)-poly(propylene oxide) type. These two chapters represent nearly two-thirds of the book and the book is well worth having in the polymer chemist's library for these two chapters alone.

F. E. Bailey, Jr., *Union Carbide Corporation*