

of the menus and standardizing commands and menus in all applications. Filevisions¹ only blatant departure from the usual Macintosh menu standard is the lack of a "Save" command. The same result is accomplished by closing and returning to the file, which takes no longer than a save, and may be confusing to the first time user of Filevision¹ who is familiar with the Macintosh. A back-up of the file may be created at any time by a "Save a copy in ..." command. There are extensive keyboard shortcuts which are learned gradually while initial use of the mouse makes learning the program quick and easy, but the well-written and illustrated manual is necessary to learn some features of the program such as creating pop-ups. The program has a nice method for setting up report formats and the data fields simply by dragging and sizing report and annotation fields on the screen. Reports and labels can be embellished with graphics and printed with up to four columns with impressive results on the Apple Imagewriter¹ printer and publication quality results on the Apple Laserwriter¹. It also has the options of reviewing the printout on the screen, creating a text file, and saving up to 20 report formats in the print library. Form letters can also be printed in a mail merge from highlighted objects; in fact mail merges are more easily accomplished than in Microsoft Word.¹

Business Filevision's higher cost compared to the original release is

certainly justified because several of its additional features are indispensable. Business Filevision¹ is not copy protected and is compatible with hierarchical file system (HFS) and the Switcher, and it also works well with a graphics tablet rather than the mouse as the input device. It has an on-line help file which shows many of the basic commands and keyboard shortcuts. A convert utility comes with the program for converting old Filevision¹ files to Business Filevision¹ files. Telos has also recently made available an import-export program for converting files to and from other Macintosh¹ programs such as Jazz,¹ Excel,¹ Overvue,¹ Microsoft File,¹ or text only files. So if you have already invested the large amounts of time required to build a database with any of these programs you can still convert them, add graphics, and enter the world of the graphic database. Telos also sends registered users a quarterly magazine with tips and information about Filevision¹ and its use. In summary if you are looking for a database system which is fun and easy to learn and use, Business Filevision¹ will be the perfect selection. If the potential application involves building complex relational databases with huge amounts of data, some of the other powerful relational databases (and probably a more powerful computer), with their additional expense and learning overhead, would be more appropriate.

B. A. Parkinson, E. I. DuPont de Nemours, Inc., Wilmington

Book Reviews*

Organotitanium Reagents in Organic Synthesis. By Manfred T. Reetz (Universität Marburg). Springer-Verlag Inc.: New York. 1986. x + 236 pp. \$76.50. ISBN 0-387-15784-0.

For many years the chemo-, regio-, and stereoselective addition of carbanions to organic electrophiles has been of major concern to synthetic chemists. One extremely useful advance in this area has been the development of organotitanium reagents (of general formula RTiX₃). In a wide variety of cases, these organotransition metal complexes exhibit greater selectivity than the more traditional organolithium and organomagnesium reagents. This "progress report" by Professor Reetz (Volume 24 in the series *Reactivity and Structure concepts in Organic Chemistry*) offers a concise summary and analysis of recent developments in this field that will certainly be of general interest to both organic and organometallic chemists.

The emphasis of this book is on understanding how a change in the electronic environment of the transition metal alters the reactivity of the alkyl group. For example, alkyltitanium trichlorides are stronger Lewis acids and thus more reactive than the less Lewis-acidic alkyltitanium trialkoxides. The reactivity patterns of a wide variety of organotitanium systems are compared and contrasted with those of other organometallic reagents.

After a brief, general introduction to organotitanium chemistry in Chapter 1, methods of synthesis and physical properties (e.g., bond energies, bond angles and lengths, aggregation states) of organotitanium compounds are presented in Chapter 2. Much of the author's own work concerning the chemoselective and stereoselective addition of organotitanium reagents to carbonyl compounds is presented in Chapters 3 and 5. The material presented in these sections goes well beyond what is normally found in the primary literature. The discussions of carbonyl differentiation and diastereofacial selectivity are particularly noteworthy. The practicing bench chemist will find the brief section concerning "hints on how to use organotitanium compounds" to be very informative. In Chapter 7, substitution reactions involving organotitanium reagents are presented.

There have been very few investigations of the kinetics of organotitanium additions. Chapter 4, which discusses rates of reactions, focuses primarily on the addition of MeTi(OCHMe)₂ to carbonyl compounds.

This book would have been more complete if the discussions of 1,4-addition reactions in Chapter 6 and Wittig-type methylenation reactions in Chapter 8 were more extensive. The reader is referred to other reviews which the author feels have adequately presented recent results in these areas.

It is often difficult for the practicing synthetic chemist to keep up with recent advances in methodology, especially when such advances occur at a very rapid pace. This book is an excellent place to turn for a brief, well-referenced review of *Organotitanium Reagents in Organic Synthesis*. It outlines recent developments in the field and in many instances points

out areas where further work is needed. In addition, the general structure/activity principles that are presented in this treatise should be useful as a guide to the rational alteration of the reactivity patterns of other organotransition metal reagents.

Daniel F. Harvey, University of California, Berkeley

Organic Structures from Spectra. By S. Sternhell and J. R. Kalman. John Wiley & Sons: New York. 1986. x + 202 pp. \$29.95. ISBN 0471-90644-1.

This is a textbook based on the concept of teaching by means of problem-solving seminars. The first 61 pages contain succinct presentations of the basic principles of absorption spectroscopy followed by the experimental features of UV, IR, NMR, and MS, together with much tabulated information of use in interpreting spectra. The bulk of the book is found in the spectra, which are arranged as problems, starting simply with methyl ethyl ketone and proceeding gradually to quite complex structures. For each unknown compound, the four types of spectra are presented graphically, with a minimum of supplementary numerical data. Both ¹H and ¹³C NMR spectra are included. These problems are intended to be used in a class that meets regularly for working on assigned problems, with a faculty member present only to give help when it is asked for, not to lecture. The authors claim greater success for this method of teaching, which is modeled on that used at the E.T.H. in Zürich, than conventional teaching. The large number (131) of problems gives great scope for such a method.

Chromatographic Methods. Fourth Edition. By A. Braithwaite and F. J. Smith (Trent Polytechnic). Chapman & Hall/Methuen Inc.: New York. 1986. x + 414 pp. Cloth: \$65.00. ISBN 0-412-26770-5. Paper: \$27.00. ISBN 0-412-25890-0.

This new edition responds to the developments since the previous edition (1974) with a rewritten chapter on plane chromatography, an expanded one on gas chromatography, and a new chapter on HPLC. A chapter titled "Spectroscopic techniques and chromatography" reflects the substantial growth of instrumentation and combined techniques. The rapid growth in importance of data processing, as applied to chromatography with the aid of computers, is the subject of another chapter. The final chapter, "Model or Practical Experiments in Chromatographic Techniques", has been revised and expanded. It contains complete experimental descriptions of a comprehensive variety of procedures (e.g., under Paper Chromatography there are five, each using a different technique). They serve well as models to show the reader how to carry out a procedure, but they can also be used as experiments in a laboratory course.

This book is well suited to be a general reference source of first resort, which will provide answers to most questions and show the user how to get going at a practical level as well as how to understand the basis for the procedures. As a textbook for instruction, it appears to be aimed at the advanced undergraduate or graduate student, but such students are likely to want to retain the book as a permanent reference.

*Unsigned book reviews are by the Book Review Editor.

Data for Biochemical Research. Third Edition. By Rex M. C. Dawson, Daphne C. Elliott, William H. Elliott, and Kenneth M. Jones. Clarendon Press, Oxford University Press: Oxford and New York. 1986. xii + 580 pp. \$59.00. ISBN 0-19-855358-7.

This is a reference compendium divided into 25 chapters on such categories as amino acids, carbohydrates, carotenoids, antimetabolites, biochemical reagents, gel electrophoresis, etc. The content is mostly in tables, which in the case of compounds have an alphabetical arrangement, and include synonyms, structural formulas, molecular weights, and physical properties, including optical properties, acidity/basicity constants, and solubility. "General remarks" are included, and these frequently give references. For other types of topic, the arrangement necessarily differs, but definitions, procedures (including analytical ones), reagents, etc. are presented in a reasonably natural order. Some information that is not explicitly included is made accessible by giving selected references. Nomenclature is handled in this way.

In this edition there are many changes, both in the inclusion of new data and the removal of old material that is no longer very important 17 years after the previous edition. This is the sort of book that should see constant use, and it is priced suitably for individual purchase.

Opioid Analgesics-Chemistry and Receptors. By Alan F. Casy (University of Bath) and Robert J. Parfitt (Canberra College of Advanced Education). Plenum Press: New York. 1986. xv + 518 pp. \$69.50.

This book is a well-written text for special topic courses on the chemical and pharmacological aspects of analgesics and their antagonists or a reference text for medicinal chemistry as it relates to the chemistry and pharmacology of opioid analgesics. A text of this nature will be an important tool to pharmaceutical industries. The book is divided into 13 chapters, the first of which provides an interesting historical background of opioid analgesics. The second chapter examines the chemistry of morphine and those pharmacologically related compounds with intact 4,5-epoxide bridges. The authors also discuss the criteria necessary for activity and those parameters that are necessary for optimizing opioid action. This chapter is followed by three chapters on the structure, synthesis, stereochemistry, derivatization and pharmacological activity of morphinans, benzomorphans and arylmorphans. These chapters also address detailed reaction schemes of chemical modification aimed at suppressing the drugs undesirable actions. In Chapters 6 to 9, the authors give consideration to pethidine, fentanyl, emthadone, and compounds related to these analgesics. Toxicity tolerance, duration of action, physiological effects, and a comparison of other pain relievers are well discussed. The book also gives an extensive review of the principles and methodology of binding experiments associated with ligands binding to opioid receptor molecules. In the latter part of the text, the authors discuss opioid receptors, localization, isolation and modes of action for ligand interactions with opioid receptors.

The chapters in this text contain a variety of reaction schemes involved in derivatizing the various pain relievers, illustrations of models for the mode of action of receptor molecules with ligands and data on potency/activities of analgesics. The chapters' references are extensive and contemporary. I recommend the book to researchers and the pharmaceutical industries as an excellent reference for analgesics synthesis and mode of action with receptor molecules and to professors as a text for a special topic course in drug studies and disposition.

Pearlie M. Fennell, *Texas Southern University*

Isotopes in Organic Chemistry. Volume 6. Isotopic Effects: Recent Developments in Theory and Experiment. Edited by E. Buncl (Queen's University) and C. C. Lee (University of Saskatchewan). Elsevier Science Publishers: Amsterdam and New York. 1984. xii + 266 pp. \$88.50. ISBN 0-444-42368-0.

This volume is the latest in a series which deserves far more notice than it has received. Volume 6 is similar to its predecessors presenting several reviews of important topics, commonly written by leaders in the field of the review. For reasons not clear to this reviewer, the volumes that have already appeared have not been the subject of wide attention in spite of the generally high quality of their contents. One would have hoped for a different fate for this volume, but unfortunately it appeared in 1984 and is still not widely known, 2 years later. The articles seem to have been written somewhat earlier still. Several of the reviews are, on the fortunate side, not reduced in value by the passage of time since their character is primarily didactic.

Chapter 4, by Sims and Lewis, is a good example. It is an excellent presentation of a particularly useful method of modeling kinetic isotope effects in terms of transition structure, based on the bond energy-bond order formalism. Sims and his co-workers have provided the most widely used computer package for executing the calculations, and this chapter is a lucid, thorough documentation of the basis for the calculations. Illustrations of the technique are shown in detail. This chapter is already

an influential document in the increasing use of these calculations in biochemistry.

To some extent, the chapters by Isaacs (Chapter 2 on the effect of pressure on kinetic isotope effects) and by Turro and Kraeutler (Chapter 3 on magnetic isotope effects) also escape the ravages of time. More than half of the Turro-Kraeutler article is given to the theory of magnetic isotope effects and the remainder to illustrative examples, so that the article is of permanent value. The Isaacs chapter concentrates on pressure effects on hydrogen isotope effects in systems where tunneling has been implicated and is thus protected by its relatively strong focus. Nevertheless, developments since 1980 have altered perceptions about some of the examples used. Forsyth's review of ^{13}C NMR shifts and coupling constants (Chapter 1) suffers rather more, although it remains a nice introduction to the subject.

Since the volumes in this series are appearing in the camera-ready format, Elsevier could improve their utility by speedier issue. It would also help to announce their availability more effectively and to include an author index in each volume. These measures are merited by the success of the editors in making a good choice of authors and in obtaining from them articles of good quality.

Richard L. Schowen, *University of Kansas*

Modern Synthetic Methods. Volume 4. 1986: Sound and Light in Synthesis; Synthesis of Enantiomerically Pure Compounds with C,C Bond Formation. Edited by R. Scheffold. Springer-Verlag: New York. 1986. 356 pp. \$29.00 soft bound. ISBN 0-387-16526-6.

This volume is a compilation of the contributions of the six lecturers at the International Seminar on Modern Synthetic Methods (Interlaken, 1986): Ultrasound in Synthesis by K. S. Suslick; Photochemically Generated Building Blocks, I, The Tricyclooctanone Approach to Polyquinane Synthesis (Part I), by K. Schaffner and M. Demuth; Photochemically Generated Building Blocks, II, The Tricyclooctanone Approach (Part II). Photochemical Methods in Cyclopentanoid Natural Products Synthesis—A Comparison, by M. Demuth; EPC Syntheses with C,C Bond Formation via Acetals and Enamines, by D. Seebach, R. Imwinkelried, and T. Weber; Asymmetric Diels-Alder Reactions with Chiral Enolates as Dienophiles, by G. Helmchen, R. Karge, and J. Weatman; Enantiomerically Pure Compounds via Chiral Organoboranes, by H. C. Brown, P. K. Jadav, and B. Singram.

All of the contributions are detailed discussions, including many citations. Basic concepts are covered, followed by applications to organic synthesis and representative experimental procedures. There is not index, but each paper has a detailed table of contents.

William H. Pearson, *The University of Michigan*

Pakistan Encyclopaedia Planta Medica. Volume 1. Edited by Atta-Ur-Rahman, Hakim Mohammed Said, and Viqar Uddin Ahmad. Hamdard Foundation Press: Karachi. 1986. vi + 373 pp. \$50.00.

This is the first volume of what will eventually be a large set, indeed. It covers 94 plants, arranged in alphabetical order, from *Abelmoschus esculentus* to *Allium sativum*. The entries list those chemical constituents that have been identified, with references, and give information on pharmacological activity and uses in indigenous medicine. Twelve pages of photographs in color complete the volume.

Zeolites—Synthesis, Structure, Technology and Application. By B. Drzaj, S. Hocevar, and S. Pejovnik (Boris Kidric Institute of Chemistry). Elsevier Science Publishers: Amsterdam. 1986. xiv + 690 pp. \$127.75. ISBN 0-444-42568-3.

This book is a collection of papers resulting from the 1984 International Symposium on Structural Determination and Use of Zeolites, held in Yugoslavia. It provides useful information for those entering the field of zeolite chemistry and catalysis, although it will primarily be of value to those involved in state-of-the-art research in this field.

Papers concerning synthesis of zeolites primarily focus on silicalite and ZSM-5, although some deal with faujasite and erionite-offretite. An excellent contribution from a plenary lecture by R. M. Barrer considers the role of Si/Al ratios, specific templates, mineralizing agents, and kinetic aspects in zeolite synthesis. Another review from a plenary lecture by R. Xu and W. Pang focuses on isomorphous substitutions in ZSM-5 zeolites including ions from groups IIIA, IVA, IVB, VB, VIB, VIIB, and VIII. Minimal discussion of the crystal structure and characterization studies of these materials are given.

The majority of papers in this book are concerned with determination of structural properties of zeolites. A short paper from a plenary lecture by W. M. Meier succinctly points out some of the traps that can be fallen into when diffraction experiments on zeolites are done. A review by Kokotailo, Fyfe, and co-workers summarizes the important contribution of ^{29}Si and ^{27}Al magic angle spinning nuclear magnetic resonance in structural studies of zeolites. The rest of the contributions in structural

determination primarily concern uses of NMR, neutron diffraction, IR, ESCA, EPR, UV-visible, and TGA studies of transition metal or dealuminated zeolites. Several of these studies involve fluid cracking and metal cluster catalysts.

The final section of this book covers technology and application of zeolites leading off with a review of a plenary lecture by R. Sersale involving natural zeolites. Uses of zeolites in cements, paper, water treatment, air conditioning, detergents, toothpastes, gas separation, and catalysis are also discussed. Methanol to gasoline conversions, hydrocarbon isomerizations, dearomatization, and hydrodesulfurization reactions are discussed.

Steven L. Suib, *The University of Connecticut*

Molecular Structure and Energetics. Volume 3. Studies of Organic Molecules. Edited by J. F. Liebman (University of Maryland Baltimore County) and A. Greenberg (New Jersey Institute of Technology). VCH Publishers: Deerfield Beach, FL. 1986. xiv + 386 pp. \$77.50. ISBN 0-89573-141-X.

Volume 3 of this series, like the first two, covers a very wide range of topics with a focus on structure-energy relationships. Some of the chapters treat very broad subjects (e.g., Macroincrementation Reactions) while others might be of interest to a smaller audience (e.g., Hydrazine-Hydrazine Cation Electron Transfer). Each chapter covers the literature through 1984 with a few 1985 citations. There is an Addendum giving more recent developments for about half of the chapters.

Molecular orbital calculations and molecular mechanics find important roles in most of the chapters in this volume, but the emphasis is on experimental results.

The volume is amply illustrated. Several of the chapters use the symbols \ll and \gg to set off material which "may be omitted in an initial reading without loss of continuity". This reviewer found it impossible to skip over this material, but it was useful to know that those were parenthetical comments.

The structure-energy relationships between substituted hydrazines and their radical cations is treated by S. F. Nelsen in Chapter 1. Chapter 2 (26 pages by G. R. Stevenson) is a short review of "aromaticity" and "antiaromaticity". The structural limitations in cyclic unsaturated hydrocarbons are covered in depth in Chapter 3 by R. P. Johnson. Chapter 4 (B. E. Smart) details the energetics of fluorinated molecules. Substituent effects on strained, cyclic organic molecules is the subject of Chapter 5 (A. Greenberg and T. A. Stevenson). Chapter 6 (J. F. Liebman) is an ambitious attempt to acquaint the reader with the "macroincrementation" method for determining many properties of organic substances. The last chapter (E. Osawa and K. Kanematsu) covers long C-C bonds in strained molecules.

The cost may prevent many individuals from purchasing this book. It would make a very valuable library addition, finding its place with the other much more diverse reviews of topics in physical organic chemistry.

Edward E. Waali, *University of Montana*

Mass Spectroscopy. 2nd edition. By H. E. Duckworth (Universities of Manitoba and Winnipeg), R. C. Barber (University of Manitoba), and V. S. Venkatasubramanian (formerly Indian Institute of Science). Cambridge University Press: New York. 1986. xiv + 337 pp. \$69.50. ISBN 0-521-23294-5.

This book is part of the series "Cambridge Monographs on Physics". As such, it is written by physicists for physicists and contains far more mathematical formulae than chemical formulae, more applications of mass spectrometry to geology and space research than to organic chemistry. It is exactly this perspective that makes the book a refreshing complement to all those other books on mass spectrometry sitting on the library shelf.

After a brief history of mass spectrometry, the chapters are devoted about equally to instrumentation (ion optics, ion sources, ion detection, deflection mass analyzers, and other mass analyzers) and applications (determination of isotopic abundances, atomic masses, applications to nuclear research, inorganic chemistry, organic chemistry, solid state physics, geology and cosmology, and upper atmosphere and space research). Each chapter is clearly and concisely written and abundantly documented (over 1150 references) to make the work an important reference. (Just how does a Wien filter or a Daly detector work?) The references cover the period from 1886 to 1980 in detail, but the more recent research is not well represented; this is perhaps the greatest weakness of the book. Fortunately, the basic physics of ion optics has not changed dramatically over the last 5 years, so the deficiency is not as noticeable in the instrumentation sections as in the applications. Coverage of techniques does not particularly reflect the extent of interest or ongoing research in areas of mass spectrometry. Fourier-transform mass spectrometry and MS-MS are each covered in 2 pages; negative-ion mass spectrometry and LC-MS are each covered in two paragraphs;

while an entire chapter is devoted to the determination of atomic masses and another to isotopic abundances. The deficiencies notwithstanding, the book is a valuable resource for the reference library or the practicing mass spectroscopist.

Robert J. Anderegg, *University of Maine*

Chemical Neurobiology. An Introduction to Neurochemistry. By H. F. Bradford (Imperial College of Science and Technology). W. H. Freeman Publishers: New York. 1986. xvi + 507 pp. \$36.95. ISBN 0-7167-1694-1.

The convergence of the disciplines of chemistry, molecular and cell biology, and neuroanatomy has led to the explosive growth and advances in neurochemistry. This book is an excellent example of this unprecedented growth in that it encompasses much more than an introduction to the field of neurochemistry. Instead, it contains a virtual wealth of major review articles and related references documenting the development of this field over the last 20+ years. There are over 1500 references cited, 25% or more of which having been published since 1980. The text is well augmented with numerous tables and figures as well as multiple light and electron micrographs.

Chapters 1-3 give the reader an introduction to the basics of neuroanatomy and neurophysiology. In most books these areas are often overlooked. It is now, however, important for neurochemists to have a familiarity with the basics of anatomy and physiology of the nervous system. Some of the subjects mentioned therein include the following: structure and function of the neuronal cytoskeleton, axonal transport, isolation and composition of neuronal membranes including separate sections on the glial contribution, especially myelin membranes. There is an especially good discussion of the role of neural cell adhesion molecules (NCAM) contained in this section. The area of neuronal cells in culture is addressed and methods discussed. Bulk isolation of either neurons or glial cells or their respective subfractions is also briefly mentioned. Finally, there is an introduction to neuronal metabolism which introduces the neurotransmitters and their biosynthetic systems.

Chapters 4-7 reflect the major areas of the author's research interests, the neurotransmitter systems, and thus are among the best and most comprehensive of all sections of the book. A brief review of all the major neurotransmitters begins this section, including the criteria for identification of putative neurotransmitters. The mechanisms of neurotransmitter release are discussed and such recently emerging ideas such as the role of inositol triphosphate and calcium calmodulin are also considered. There is an excellent review of the neuropeptides with analysis of their activity in the modulation of target organ effects outside the central nervous system. The isolation, preparation, and characterization of synaptosomes are addressed next. The author delineates the important role of purified synaptosomal fractions and subfractions in the study of neurotransmitter metabolism and regulation. Finally, this section concludes with a review of synaptic development and regulation of function.

Chapters 8 and 9 conclude this book with a discussion of the correlation of neurotransmitter systems and behavior, both in normal and pathological states. The author reviews the possible role of peptides and behavior in addition to the well-documented role of the catecholamines, serotonin, and acetylcholine. Possible mechanisms of neurotransmitter system dysfunction and their role in movement disorders, psychological disorders, and epilepsy are all considered.

In summary, this is a superb, comprehensive yet concise introductory neurochemistry textbook. For a single author, this book represents a monumental review of the current literature. Most importantly, Bradford is able to synthesize the diverse and sometimes seemingly contradictory findings in the new and rapidly growing field of neurochemistry into an understandable composite. The book is sure to be a frequently consulted text on the shelves of both chemists training in the neurosciences as well as those already well established.

Kimion J. Angelides, *Baylor College of Medicine*

Instrumental Analysis. 2nd edition. Edited by Gary D. Christian (University of Washington) and James E. O'Reilly (University of Kentucky). Allyn and Bacon, Inc.: Newton, MA. 1986. xviii + 933 pp. \$37.00. ISBN 0-205-08640-3.

The editors have undertaken the unenviable task of combining the talents of numerous authors for the purpose of cohesively presenting a readable overview of instrumental methods of chemical analysis. As with the first edition, the basic approach of the text has been to emphasize the methods and applications of instrumentation to quantitative chemical analysis, rather than to provide a comprehensive description of chemical instrumentation. This emphasis remains somewhat unique and appropriate. Overall, the editors have done a commendable job of maintaining the original focus.

The text can be generally subdivided into electrochemistry (Chapters 1-5), spectroscopy (Chapters 6-16), chromatography (Chapters 20-22),

electronics and automation (Chapters 23–25), and other (Chapters 17–19) sections. The approach to this organization appears to be the provision of a light description of general principles (i.e., Chapters 1, 6, and perhaps 20), followed by detailed discussion of specific areas. To a certain extent this leads to redundancy, such as the repeated discussion of the Nernst equation in Chapters 1 and 2. The purpose of these introductory chapters should probably be the discussion of unifying principles for the various sections (defined herein and *not* in the text); however, especially with regard to spectroscopic instrumentation this is not the case. For example, the use of photomultipliers is almost universal in optical spectroscopy; however, they are only discussed in any detail in the chapter concerning absorbance measurements and not mentioned in the chapter introducing spectroscopy.

In order to accommodate the initial goals of the editors (as outlined in the preface), guidance to authors included a request to minimize the theoretical aspects of each topic. Adherence to this guidance is, perhaps not surprisingly, variable. In contrast to the very brief theoretical treatment employed in the chapter concerning emission spectroscopy (Chapter 11), the theoretical aspects of luminescence (Chapter 9) and kinetic methods (Chapter 18) seem overly detailed. For example, a theoretical discussion of polarization in fluorescence is included in Chapter 9 and not addressed further, in any aspect.

Other goals include overcoming the shortcomings of other texts with respect to modernity. Typically, the *latest* references listed were from 1982 or well before. Some recent topics such as ICP–MS were never mentioned. In addition, the inclusion of a separate chapter concerning solvent extraction (Chapter 20) in a text concerning modern instrumental analysis seems out of place.

A major shortcoming is the lack of *any* unifying treatment of data (i.e., precision, accuracy, etc.). Descriptions of limits of detection are highly variable and rarely defined. No discussion of sampling, sample handling/preparation, is included. For a text with a stated emphasis on quantitative analysis, these absences are surprising.

The text has a number of outstanding attributes. The emphasis on chemical applications, although not universally applied, is very informative and in some respects may supercede any requirement for a laboratory manual. I found the chapter concerning polarography and voltammetry (i.e., pilot ion method, general and detailed applications) and the chapter concerning fluorescence particularly to provide a wealth of useful information and references.

Another goal of the editors has been to provide a *readable* version of instrumental analysis. In this respect the text is excellent, with few exceptions. The chapters concerning flame spectroscopy and liquid chromatography are particularly good.

Overall, the textbook is a reasonably comprehensive, readable introduction to instrumentation analysis and suited for senior-level undergraduate courses. The text provides a wealth of application information which can be easily applied to a concurrent laboratory.

John A. Koropchak, *Southern Illinois University*

Forensic Science Progress. Volume I. Edited by A. Moebly and R. L. Williams. Springer-Verlag: New York. 1986. 172 pp. \$53.00. ISBN 0-387-12936-7.

"Forensic Science Progress" is intended to pick up where the four-volume series "Methods in Forensic Science" (Interscience Publishers, 1962–1965) left off. The aim of this new series is to "produce contributions of high quality by leading scientists in the field of forensic science". To a large extent, the publisher has accomplished the task in Volume I. The format of the new series may frustrate the harried forensic scientist looking for details to solve a problem of immediate urgency.

This thin volume contains five chapters; each chapter is written by a different author and is on a different area of forensic investigation.

Chapter One deals with Forensic Soil Characterization and was written by J. I. Thornton. Thornton has produced a concise, fact-filled chapter, which introduces the concept of soil uniqueness and discusses current methods for characterizing soil. Thornton concludes his review with the observation that "progress in the forensic characterization of soil is likely to move in the direction of biology and biochemistry". One hopes that Thornton will expand this slim chapter into the full-length volume it deserves.

Chapter Two deals with the Determination of Blood Groups in Tissue Samples and was written by Mukoyama and Seta. This chapter describes in some detail procedures for ABO grouping of human bone tissue, human dental tissue, human hair, human nails and human soft tissues (organs). Practicing forensic scientists will appreciate the detailed procedures found in this chapter.

Chapter Three deals with Death: Accident or Suicide by Use of Firearms and was written by K. Sellier. In this chapter Sellier discusses a very difficult and sometimes controversial area of forensic investigation.

Sellier concludes his review by stating "Deaths from firearms can be the result of murder, suicide, or accident. To differentiate between the first two cases is easier than deciding the latter pair, since for many of these factors such as shooting distance, size of entry hole, etc., can be the same." A tabulated list of important points needing attention at the scene of the crime should be of interest to most crime-scene investigators.

Chapter Four deals with the Scientific Investigation of Fire Causes and was written by P. J. Thatcher. In this chapter, the reasons for committing arson, fire scene examination, accelerants, sample collection and laboratory examination of items involved in fire-related cases are discussed. The author concludes this chapter with an interesting observation which most forensic analysts should keep in mind: "It should never be forgotten that fire investigators do not prove or disprove arson merely by establishing fire causes, however definite they are on this point. But, fire investigation does provide the fundamental information which is necessary before any arson investigation can proceed: that is, not only how the crime was committed, but indeed the likelihood of whether a crime has been committed at all."

Chapter Five deals with the Detection of Art Forgeries With Scientific Methods and was written by J. Riederer. This fascinating chapter deals with the definition of an art forgery, the history of art forgery, and analytical techniques for the detection of forgeries. Anyone interested in the combination of scientific analysis with the experience of the historical sciences on stylistic features of art objects will find this chapter an important contribution to an unpublicized area of forensic investigation.

The editors of this series should be congratulated on producing a concise, well-documented volume describing five important areas of forensic investigation. The editing of this volume is so tight that not a word is wasted. One wishes that the publisher would make room for a little frosting in this finely tuned volume.

W. W. McGee, *University of Central Florida*

Fourier Transform Infrared Spectrometry. By Peter R. Griffiths (University of California, Riverside) and James A. de Haseth (University of Georgia). John Wiley & Sons: New York. 1986. xv + 656 pp. \$75.00. ISBN 0-471-09902-3.

As the authors point out in their preface, this is a new book and not merely a revision of Griffiths' *Chemical Infrared Fourier Transform Spectroscopy* of 1974. A page-by-page comparison shows that only the first chapter of the latter, dealing with the introductory theory, remains largely unchanged; other chapters have been extensively changed and 11 new ones added. The extensive coverage of the various topics is made clear by the chapter titles: (1) The Michelson Interferometer, (2) Sampling the Interferogram, (3) Computing Techniques, (4) Two-beam Interferometers, (5) Auxiliary Optics for FT–IR Spectrometers, (6) Data Systems, (7) Signal-To-Noise Ratio, (8) Reduction of Dynamic Range in FT–IR Spectrometry, (9) Photothermal Fourier Spectrometry, (10) Quantitative Analysis, (11) Dispersive Fourier Transform Spectrometry, (12) FT–IR Spectrometry of Time-Dependent Phenomena, (13) FT–IR Studies of Polymers, (14) Biochemical and Biomedical Applications, (15) Low-Temperature Studies, (16) Atomic Emission Studies, (17) Surface Analysis, (18) GC/FT–IR Spectrometry, and (19) The HPLC/FT–IR Interface. Each chapter is ended by a citation of references. The Index of 9 double-columned pages is useful (although still too short to suit this reviewer). In general, the book represents an excellent coverage of FT–IR spectroscopy. Many "applications" topics are given although, of course, the literally thousands of FT papers preclude complete coverage; two or three additional volumes would be needed for that. The book is a "should have" item for those working in the field, and certainly a "must have" item for those contemplating FT–IR work.

M. J. D. Low, *New York University*

NMR in the Life Sciences. Edited by E. M. Bradbury (University of California, Davis) and C. Nicolini (University of Genoa). Plenum Press: New York. 1986. viii + 237 pp. \$45.00. ISBN 0-306-42279-4.

This volume presents the proceedings of a NATO Advanced Study Institute held in June 1985 and consists of 17 papers encompassing the areas of high-resolution NMR of proteins and nucleic acids, high-resolution NMR applied to complex systems (cells, organs, tissues) *in vivo* and *ex vivo*, and NMR imaging.

The initial 8 papers in the book cover a range of topics concerned with high-resolution NMR of macromolecules. Included here are discussions of methods for solvent suppression in ¹H NMR studies of H₂O solutions, 2D NMR methods, ¹H NMR assignment strategies for nucleic acids, studies of protein–ligand interactions, and the combined use of NMR and computer techniques for the elucidation of macromolecular conformation and dynamics. The remainder of this book consists of papers addressing techniques employed in and examples of *in vivo* and *ex vivo* NMR studies in which chemical-shift information is desired and NMR imaging.

Specific topics addressed include methods for and applications of spatial discrimination in isolated tissues and in vivo with major emphasis on ^{31}P NMR, water relaxation times of cells and tissues in normal and abnormal states and the correlation of relaxation behavior with histological features, the theory of NMR imaging, the evaluation of the effects of field strength and data acquisition method on image quality, and the combination of high-field ^1H NMR imaging with ^{31}P , ^{13}C , and ^1H chemical shift spectroscopy for clinical applications.

Since many authors are involved, there is considerable variation in style and format throughout the volume. Nonetheless, the individual papers are lucid, concise, and informative. The reader of this book is assumed to be familiar with the fundamentals of NMR theory and techniques, and for such readers with an interest in biological NMR this volume should prove to be highly valuable.

Henry I. Mosberg, *The University of Michigan*

Advances in Cereal Science and Technology. Volume VIII. Edited by Y. Pomeranz (U.S. Department of Agriculture, Manhattan, Kansas). American Association of Cereal Chemists: St. Paul. 1986. ix + 364 pp. \$60.00. ISBN 0-913250-45-7.

The seven chapters in this book will be of interest mainly to cereal chemists, although the chapter on yeasts may find a wider audience. Other topics include international cooperation in cereal research, effects of sulfur supply, chromatography of cereal proteins, morphology, genetics, and traditional foods from sorghum. References and an index are included. The print is typeset.

M. C. W. Smith, *Ann Arbor, Michigan*

Methods of Biochemical Analysis, Volume 31. Edited by David Glick (Stanford University Medical Center). John Wiley and Sons: New York. 1985. viii + 541 pp. \$64.95. ISBN 0471-82177-2.

This volume consists of reviews of eight unrelated topics in biochemical analysis. The scope of the articles ranges from an update of developments since a topic was last reviewed in this series to comprehensive reviews.

The topics reviewed are the following: (1) The Rapid-Flow-Quench Method in the Study of Fast Reactions in Biochemistry: Extension to Subzero Conditions by T. E. Barman and F. Travers; (2) Circular Dichroism and Its Empirical Application to Biopolymers by W. C. Johnson, Jr.; (3) Continuous Measurement of Dissolved Gases in Biochemical Systems with the Quadrupole Mass Spectrometer by H. Degn, R. P. Cox, and D. Lloyd; (4) Platelet-Activating Factor Isolation, Identification, and Assay by D. J. Hanahan and S. T. Weintraub; (5) Biomedical Uses of High-Performance Liquid Chromatography with Electrochemical Detection by I. N. Mefford; (6) Recent Developments in Biochemical Nuclear Magnetic Resonance Spectroscopy by J. L. Bock; (7) Chemiluminescence as an Analytical Tool in Cell Biology and Medicine by A. K. Campbell, M. B. Hallett, and I. Weeks; and (8) Computers in Biochemical Analysis by M. J. C. Crabbe.

Reviews 1-3 and 5-7 all present some discussion of theory and instrumentation, followed by numerous examples of the applications of the methods to problems in biochemistry. The emphasis of the review on the rapid-flow-quench method is on practical aspects, particularly methods for quenching reactions, and on how the method can be used to obtain information about enzyme mechanisms. The review on circular dichroism is a lengthy (104 pages) and complete coverage of the topic, starting with the nature of light and ending with an excellent survey of the literature on the use of circular dichroism to obtain information about the conformations of biopolymers. The review on liquid chromatography presents a concise but reasonably complete summary of electrochemical detectors (LCEC). The use of LCEC in biochemical analysis is well illustrated by an excellent review of the determination of neuroregulatory compounds. Unfortunately, important determinations by LCEC of other classes of biochemical compounds, e.g., sulfur-containing, have not been reviewed. The article on NMR reviews developments in the techniques of NMR since its last review in this series in 1979. Recent applications of NMR to the determination of molecular structure, the mechanisms of biochemical reactions, and the study of living systems and the use of

NMR in medical diagnosis are described. In the review on the measurement of dissolved gases, the use of quadrupole mass spectrometry to study enzyme reactions that have dissolved gases as substrates or products is described. The review on chemiluminescence includes an excellent survey of biochemical applications of chemiluminescent assays.

The article on platelet activating factor discusses its chemical nature and the formidable obstacles to its detection and quantitation in biological systems. Finally, the application of computer technology to biochemistry is the subject of the last review. Examples discussed include the analysis of kinetic data and the analysis of molecular structure. Tables of literature references to computer programs for these and other applications are given.

The eight articles in this volume present authoritative coverage of the topics. Those on techniques are particularly recommended as an excellent source of information about current applications to problems in biochemistry.

Dallas L. Rabenstein, *University of California, Riverside*

Photometric Determination of Traces of Metals. By Hiroshi Onishi (University of Tsukuba, Japan). John Wiley & Sons, Inc.: New York. 1986. xix + 885 pp. \$139.95. ISBN 0471-86139-1.

The first three editions of this widely used classic were published under the title "Colorimetric Determination of Traces of Metals", with E. B. Sandell as author. Part I (General Aspects) of the fourth edition was co-authored by E. B. Sandell and H. Onishi and published in 1978. After Sandell's death in 1984, Onishi assumed the monumental task of revising Part II. This book (Part IIA) consists of 21 chapters in which the photometric determinations of the individual metals, aluminum to lithium (including the lanthanoids), are described. Each chapter is divided into three sections: Separations, Methods of Determination, and Applications. The sections on Separations are of general interest and include methods based on precipitation, ion-exchange, chromatography, and liquid-liquid extraction. Molecular absorption and fluorescence techniques are described in the sections on determinations, and the emphasis is on the use of well-established reagents. Several reagents that have been recently introduced for the determination of trace levels of metals are also critically reviewed at the end of each section on methods of determination. Important applications of these methods to the determination of trace metals in complex organic and inorganic materials are described in detail at the end of each chapter.

Despite the widespread use of electrochemical and atomic spectroscopic techniques for the determination of low concentrations of metals in complex matrices, the molecular absorption and fluorescence methods that are described in this book are of considerable importance to many chemists who routinely use these methods. At the beginning of each chapter that is devoted to a particular metal, there is much useful information on the dissolution of organic and inorganic materials containing the metal. In the course of sample preparation and the analysis of trace levels of metals, significant losses can occur as a result of volatilization, adsorption, and even via side reactions; many such examples are given in each chapter. The general surveys of separation methods that are applicable to each metal are well documented with numerous references, and the selected photometric methods are described in great detail. The most useful sections in each chapter are the applications of these methods to "real-world" organic and inorganic materials. This information is often summarized in tables or, in appropriate instances, detailed procedures are given. The "Notes" at the end of each chapter contain references to the literature and extensive comments on many of the reports in the literature. Recent publications have been included as "Addenda" in each chapter.

This is a welcome revision of an acknowledged classic in an important series of monographs on Analytical Chemistry and its Applications. This volume is well written with careful attention to detail. Chemists who routinely employ photometric methods in their laboratories will find continued use for this valuable reference work.

Quintus Fernando, *University of Arizona*