Book Reviews

The Literature Matrix of Chemistry. By Herman Skolnik. Wiley, New York. 1982. xi + 297 pp. 16 × 23.5 cm. ISBN 0-471-79545-3. $30.00.

The author is among the best-qualified persons to write a book on the current status of the literature of chemistry and on its use by chemists and chemical engineers. He retired in 1979 after 40 years of involvement in industrial literature services, mostly as the manager of the Technical Information Division of Hercules, Inc. Among many honors he received the ACS Columbus/Dayton Section's Patterson Award in Chemical Documentation (1969) and was the first recipient of the ACS Division of Chemical Information's Award for Excellence in Chemical Information Science (1976), which award now bears his name. He has been editor of the ACS *Journal of Chemical Information and Computer Science* since its introduction in 1961.

The book appears to be the first formal exposition of the status of chemical literature since the three classics by Crane and Patterson (1927) (with Marr, 1957), Mellon (1928, 1940, 1948), and Soule (1938). It is a scholarly work. Each of its chapters includes a historical background for the topic discussed, and the two final chapters are devoted to a description of the evolution of the literature from antiquity to the early 1900's and to a listing of over 100 major contributors to the literature from Samuel Bard (1742–1821) to Ernest Huntress (1898–1970). The book differs from that of R. E. Maizell (1979), which is a "how to" book that complements Skolnik, just as Mellon and Soule once complemented Crane and Patterson.

It is obvious that Skolnik feels keenly the need for more effective instruction in the use of the literature. There once was a belief that such a facility not only got the young chemist off to a better start but also made possible a lifetime of self-education. He regrets that courses in the literature, history, and philosophy of chemistry are not currently offered in most academic institutions.

The chapters are: "Books"; "Encyclopedias and Treatises"; "Numerical Data Compilations"; "Patents"; "The Journal Literature"; "Secondary Publications, Operations, and Services"; "Chemical Abstracts Services"; "Other Indexing/Abstracting Services"; "Computer-Based Information Services"; and the two historical chapters mentioned above. There are excellent name and subject indexes. The treatment of medicinal chemistry literature is adequate in all categories, particularly in that of computer-based information services. Coverage includes business and economic aspects of chemical science, as well as laboratory-based aspects. There are a few errors, of which the listing of the "Nobel" gases (p 58) is the noblest of all.

Well over 700 books are listed, 29 of which are in the biochemistry group. Because many of the books undergo revisions, Skolnik omits publication dates. Most of the books listed appear to be available in recent editions.

The 11-page description of encyclopedias and treatises is too brief. Beilstein is the only one covered in detail; no mention is made of the large up-to-date chart of the work available gratis from the publisher. The lectures on Beilstein and Gmelin that are given at national ACS meetings are not mentioned. The carefully reviewed compilation of 70 items for each of over 900 chemicals of commerce in the Department of Transportation's Chemical Hazards Response Information System (CHRIS) is not included.

The long discussion of patents is much more than the average chemist needs. The bibliography alone occupies over three pages of fine print.

The longest chapter in the book covers the journal literature. A section on the ranking of chemical journals contains 14 tables that massage the data in various ways. There is no table devoted to journals of interest to medicinal chemists, and the *Journal of Medicinal Chemistry* is not included in the biochemistry table. In the table of industrial journals, no mention is made of one of industry's most eagerly awaited journals, the *Commerce Business Daily*. Dr. Skolnik reaches the conclusion that synopsis journals must now be considered as a solution to the increasing flood of hard-copy journals.

The discussions of Chemical Abstracts Service and other indexing/abstracting services are encyclopedic. One must understand all that is said, but he will not find recommended procedures for the use of the services.

The chapter on computer-based information services is an excellent critical essay on computerized information and on the data-base brokers and their products. It includes tables of all the domestic and foreign vendors and 77 references to extended relevant discussions. It is concluded that present on-line systems are best used with an intermediary specialist who devotes full time to on-line searching and that we still need retrieval systems that yield only the desired references, that permit browsing, and that allow interaction with the data base as we now interact with fellow chemists.

Dr. Skolnik believes that despite the progress in computerized information systems and in telecommunications, most of us will continue to read and file printed documents for some time to come. However, the paperless society is on the horizon and will be part of our future. In this connection, your reviewer recommends reading (on paper, not TV) William Broad's essay (*Science* **1982**, *216*, 964) on the electronic future of scientific journals, in which we chemists will be bystanders in the battle between publishers of paper journals and entrepeneurs of the electronic future. As Art Buchwald describes one of our contemporaries, "He reads computer magazines the way he used to read *Playboy*. His idea of a centerfold now is a 64-K Ram Microcomputer that will expand to 128 bytes and produce a six-color high graphic screen resolution".

Amherst, Massachusetts **Edward R. Atkinson**

Acetylsalicylic Acid: New Uses for an Old Drug. Edited by H. J. M. Barnett, J. Hirsh, and J. Fraser Mustard. Raven Press, New York. 1982. x + 278 pp. 16 × 24 cm. ISBN 0-89004-647-6. $39.00.

This book is the proceedings of the First Canadian Conference on Acetylsalicylic Acid: New Uses for an Old Drug, held in April 1980. In no way is it a replacement for "The Salicylates" by M. J. H. Smith and P. K. Smith published in 1966. Rather, this is a continuation based almost entirely on work published subsequent to Smith and Smith.

The symposium consisted of 18 papers grouped under 6 headings. These headings are "Prostaglandins in Disease" (three papers and discussion), "Effects of Acetylsalicyclic Acid" (two papers and discussion), "Effects of Acetylsalicylic Acid on Various Organs and Tissue Functions" (six papers and discussion), "Clinical Application of Prostaglandin Inhibition by Acetylsalicylic Acid" (five papers and two discussion sections), "Adverse Effects and Unresolved Issues" (one paper and discussion), and "Unresolved Issues Arising from Clinical Trials" (one paper, discussion, and closing remarks).

Each paper emphasizes the current state of knowledge, but of necessity almost no references later than 1979 are included. Similarly, almost none predate Smith and Smith. This volume is clearly the present thoughts on aspirin mechanism and utilization.

As the current state of the art, this book will probably remain the definitive summary for several more years. The six-page index is well constructed, facilitating access to the desired subtopic and,

hence, justifying its use as an initial reference source for any person active in this area or interested in the subject.

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The Alkaloids. Volume XVIII. Chemistry and Physiology. R. H. F. Manske, Founding Editor; R. H. A. Rodrigo, Editor. Academic Press, New York. 1981. xvi + 411 pp. 15.5 × 23.5 cm. ISBN 0-12-469518-3. $65.00.

This volume of *The Alkaloids* presents timely reviews of three groups, "The Erythrina and Related Alkaloids" (S. F. Dyke and S. N. Quessy), "Lythraceae" (W. M. Golebiewski and J. T. Wrobel) and "C_{20}-Diterpenoid Alkaloids" (S. W. Pelletier and N. V. Mody), including a useful catalog of these alkaloids. One chapter is devoted to a discussion of the "^{13}Carbon-NMR Spectra of Benzylisoquinolines" (D. W. Hughes and D. B. MacLean), and the fifth chapter (H. L. Holland) collects and reviews work on the microbial and in vitro transformations of the alkaloids, subjects that have attracted increasing attention in recent years. A subject index for this volume and the contents of all previous volumes are included. This volume will be useful to researchers in alkaloid chemistry as have been the previous 17, and we congratulate the editor and the contributors for maintaining the high quality of this series founded by the late R. H. F. Manske.

Staff

Advances in Heterocyclic Chemistry. Volume 30. Edited by A. R. Katritzky. Academic Press, New York. 1982. ix + 408 pp. 16 × 23.5 cm. ISBN 0-12-020630-7. $76.50.

Ever since the first volume was published in 1963, *Advances in Heterocyclic Chemistry* has presented a series of monographs dealing with virtually every area of heterocyclic chemistry. It has tended to stress the theoretical and mechanistic aspects of the subject and has often attempted to compare synthetic approaches, physical properties, and chemical behavior of related systems. In so doing it has given the chemist a basis for understanding the influence of heteroatoms on the chemistry of cyclic systems.

This volume is divided into seven chapters dealing with different subjects. A chapter on "Recent Advances in Furan Chemistry" by F. M. Dean extends a previous review in this series and covers the synthesis and chemistry of monocyclic furan rings for the period 1968 through 1979. This review contains a wealth of information about the burgeoning field of furan chemistry. It provides illustrative examples of synthetic methods and chemistry and many references to appropriate reviews and original literature. It suffers from a relative lack of illustrative structural formulas and chemical equations and a style of writing that often requires careful scrutiny to glean its intended meaning.

A chapter by A. B. Hörnfeldt provides a good review of selenophenes, which updates a review by N. N. Magdesieva, published in this series in 1970. This review contains particularly interesting sections that describe studies comparing the physical and spectral characteristics of selenophenes with those of other five-membered heterocyclic systems. Sections on the chemical reactivity of the selenophenes are also liberally salted with comparisons to related heterocycles. Brief sections consider pharmacologically interesting systems and potential technical utility for the selenophenes.

A well-written, comprehensive review of the synthesis, physical and chemical properties, and applications of the heteroadamantanes, adamantane derivatives with one or more of the skeletal carbons replaced by nitrogen, oxygen, or sulfur, is presented by T. Sasaki. Because of their unique rigid structures, several of these compounds have interesting physical or chemical properties that have been throughly studied. Some also have interesting biological activity; 1,3-diazaadamantane, for example, is a convulsant with activity similar to that of strychnine. It is somewhat surprising, therefore, that many of these systems have not been thoroughly studied and several remain unknown.

The review entitled "The Photochemistry of Nitrogen-Containing Heterocycles" by S. T. Reid updates Dr. Reid's previous review in this series. It is well written and covers many photochemical cyclizations and transformations of nitrogen heterocycles that appear to have considerable synthetic merit. Careful review of this chapter by the medicinal chemist with an interest in heterocyclic systems is warranted.

Diethyl azodicarboxylate has now become well known for its general utility in the so-called DEAD reactions with alcohols. The chapter in this volume by C. J. Moody reviews the reactions of both cyclic and acyclic azodicarbonyl compounds useful for the preparation of heterocyclic systems incorporating one or both of the azo nitrogens. When appropriate, the chemical behavior of these electrophilic compounds is compared to that of the well-known carbon analogues. Azodicarbonyl compounds appear to be particularly useful for their reactions with 1,3 dipoles and dienes. The latter Diels–Alder reaction can be reversed and can thus serve as a means of protecting potentially labile 1,3-diene systems.

The use of transition organometalic chemistry for the synthesis and modification of heterocyclic systems is reviewed in a chapter by J. L. Davidson and P. N. Preston. After a brief discussion of the types of organometalic reactions normally encountered, the chapter is organized by the type of heterocyclic system. It is thus easy to determine if, for example, organometalic chemistry has been used to functionalize an indole system or synthesize a benzodiazepine.

Sulfur transfer reagents, reagents that have been used to incorporate a sulfur atom into a heterocyclic system, are reviewed in a chapter by M. Davis. This chapter is particularly valuable for recording the many varied sulfur transfer reagents and, thus, for comparing their behavior and utility for constructing sulfur-containing heterocycles.

In general, this volume meets the previous high standards set by the series. It is well edited and relatively free of printing errors. Most chapters appear to cover the literature through 1979, with some extending their coverage into 1980. Like other recent volumes, this volume has a Cumulative Index of Titles that serves as a ready reference to subjects previously reviewed by the series.

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Annual Review of Pharmacology and Toxicology. Volume 22. Edited by Robert George, Ronald Okun, and Arthur K. Cho. Annual Reviews Inc., Palo Alto, CA. 1982. viii + 739 pp. 15 × 23 cm. ISBN 8234-0422-5. $22.00 ($25.00 outside the U.S.A.).

The following headings serve to highlight some of the many interesting features in these wide-ranging reviews of a very broad discipline.

(a) Clarification of Mechanisms of Action. The γ-aminobutyric acid (GABA) receptor of neuronal membranes appears to be linked to a benzodiazepine receptor and a picrotoxin barbiturate receptor (Olsen). The three receptors form a complex with the chloride channel, and modulation of this complex may explain many of the actions of sedatives and anticonvulsant and convulsant drugs.

The neurotoxicity of *n*-hexane and 2-hexanone depends on their metabolism to 2,5-hexanedione (Couri and Milks). However, the way in which γ-diketones produce peripheral neuropathy remains obscure. Postulated mechanisms, such as decreased energy production after inhibition of glyceraldehyde-3-phosphate dehydrogenase or the cross-linking of neurofilaments, still lack clear experimental verification.

The toxic responses to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) are pleiotropic (Poland and Knutson). They include the induction of aryl hydrocarbon hydroxylase and other drug-metabolizing enzymes, either increased growth or atrophy of various tissues, and carcinogenesis. A cytosolic TCDD receptor resembles steroid receptors and serves to transport its ligand to the nucleus.

Here TCDD may produce coordinate expression of several genes, depending on the animal species being tested. Genetic studies have linked receptor binding and TCDD toxicity with the *Ah* locus. The TCDD receptor may normally be subject to transient occupation by endogenous ligands. Prolonged occupation by TCDD and related compounds might lead to sustained activation of pleiotropic genes.

The toxic effects of thionosulfur-containing compounds include bone marrow depression, liver and lung damage, carcinogenesis, and the inhibition of drug-metabolizing enzymes. Neal and Halpert review the evidence showing that metabolic activation of such compounds is required for toxicity, with particular emphasis on parathion, carbon disulfide, and thioacetamide.

(b) Use of Drugs to Elucidate Normal Physiological Mechanisms. Toretti describes the use of catecholamine agonists and antagonists to study the control of renin release from juxtaglomerular granular cells. Both in vivo and in vitro the release of renin is subject to β-adrenergic stimulation (involving adenyl cyclase) and α-adrenergic inhibition (possibly via activation of presynaptic α_2 receptors).

Breznoff and Giuliano describe the way in which cholinergic and anticholinergic drugs, acetylcholinesterase inhibitors, and labeled cholinergic ligands have been used to define central muscarinic mechanisms that modulate blood pressure and heart rate. Activation of receptors in the midbrain, brainstem, and hypothalmus leads to increased central sympathetic outflow, the release of antidiuretic hormone, and modulation of heart rate via baroreceptor reflexes.

The application of similar approaches to the physiology of behavior is a much more difficult problem (Russel). There is evidence for the involvement of central muscarinic systems in Alzheimer's disease, as well as in a variety of normal behaviors. The author makes the cogent point that while the cholinergic system is essential for normal behavior, it is not sufficient to support any behavior by itself.

Acetylcholine also seems to play a facilitatory role in the processing of pain signals, as shown by acupuncture experiments (Han and Terenius). Of the neurohormones that have been studied, the most prominent is 5-hydroxytryptamine, but it is still too early to formulate a defined mechanism.

(c) New Developments in Biochemistry and Physiology That Relate to the Actions of Drugs and Poisons. Herbette, Messineo, and Katz relate the properties of the sarcoplasmic reticulum to some effects of local and general anesthetics, calcium channel blockers, thyroxine, and caffeine. Analysis of the interaction of amphiphiles, such as propranolol, with the sarcoplasmic reticulum may be relevant for other membranes as well.

The complex interaction of estrogens with neurohormone receptors is the subject of many contradictory reports. There is also considerable confusion concerning the role of neurohormones in ovulation and female sexual behavior. A confounding factor is systemic drug administration and the use of unphysiological doses and times of administration. In their critical review of the action of gonadal steroid hormones on the brain, McEwen and Parsons have taken pains to distinguish between direct effects and indirect effects, such as those mediated by the release of prolactin or dopamine.

The physiology and pharmacology of LHRH and somatostatin now encompass considerable new material because both peptides have a much broader spectrum of action than originally reported. In his review, McCann suggests that for this reason, somatostatin should be renamed "panhibin".

In presenting what is known about chemical transmission in the auditory system, the aim of Guth and Melamed is to interest pharmacologists in studying how drugs act on this system. Here is an example of physiology in search of pharmacology. Efferent transmission in the cochlea appears to be cholinergic, but the neurotransmitter of the afferent system does not correspond to any known transmitter substance. The cochlear nucleus contains receptors for several known transmitters, but their function is still unclear.

Neu examines recently isolated or synthesized β-lactam antibiotics from the vantage point of new information about the ways in which these drugs enter microorganisms and bind to bacterial proteins. Most of the chapter is a recital of the properties and uses of new candidates for what the author thinks may be "the antibacterial agents for the 1980s".

(d) New Disciplines or Areas of Interest. A survey of food–drug interactions (Carr) covers the effect of diet on mixed-function oxidase activities of intestinal and liver cells and the influence of food additives and dietary components on chemical carcinogenesis and hepatotoxicity. Drug therapy can influence calcium homeostasis by altering the hydroxylation of vitamin D. Dietary fiber may alter the bioavailability of metal ions, as well as reduce the toxicity of aflatoxins, estrogens, and some carcinogens.

The use of indwelling catheters to draw repeated samples of fetal and maternal blood from pregnant ewes has yielded considerable information about perinatal pharmacokinetics (Szeto). Additional insights into the distribution and fate of drugs in the mother, fetus, and amniotic fluid may someday lead to routine in utero therapy of fetal diseases.

Sociopharmacology is a very broad term. McGuire, Raleigh, and Brammer define it as a field or discipline that deals with the effects of drugs on the behavior and feelings of individuals in social settings. While this definition does include some interesting considerations of the effect of social rank and social mileu on drug responses, I still find it difficult to distinguish sociopharmacology from behavioral pharmacology.

A review of insect attractants (Plimmer, Inscoe, and McGovern) may seem out of place in this volume. However, it does fall within the scope of comparative pharmacology. Work in this area has progressed to the point where electrophysiological responses to a few molecules of pheromone can be measured in a single hair-like sensilla from the antenna of a moth.

Another comparative chapter, by Guzelian, describes the toxicology of chlordecone (Kepone). Kepone is one environmental chemical that has been studied extensively in humans (as a result of accidental exposure) as well as in laboratory. Toxic effects include tremor [attributed to inhibition of membrane-bound (Na^+,K^+)ATPase], induction of the hepatic cytochrome P-450 system, impaired reproduction associated with estrogen-like effects, and carcinogenesis in the liver. While these responses are similar in most animals, there are interesting species differences in the intestinal transport and metabolism of kepone.

(e) New Applications of Drugs. The ways in which β-adrenergic blockers, vasodilators, streptokinase, hyaluronidase, calcium antagonists, and antiinflammatory agents could be used to decrease the tissue damage of myocardial infarction are reviewed by Lange and Sobel. The evidence for beneficial intervention with most of these agents is based largely on preliminary experiments with laboratory animals. However, there are encouraging indications that several of these treatments do reduce damage in human patients.

Monovalent carboxylic inophores (Pressman and Fahim) are not included in the above compilation. By bringing sodium ions into cells, the inophores promote the release of calcium ions into the cytosol. The resultant increase in cardiac contractility and coronary flow might prove useful in the treatment of myocardial failure and shock. Some of these agents, such as monensin, are being added to poultry feed in order to control coccidiosis and to cattle feed in order to increase the efficiency of rumen fermentations. Absorption of small amounts of the drugs from meat and poultry by patients who have diseased and partially obstructed coronary vessels could conceivably produce excessive dilation of these vessels and myocardial damage.

Saunders reviews the evidence for a role of platelets in atherogenesis. New modes for possible pharmacological intervention include inhibition of platelet adhesion, α-granule release, or the proliferation of smooth-muscle cells. None of the current antiplatelet agents seem to hold much promise in this regard, and newer specific drugs will have to be developed.

The prefatory chapter describes the interesting encounters that led Thomas Maren to an illustrious career in chemotherapy and academic pharmacology. The title of this chapter, "Great Expectations" underscores the importance of an optimistic approach to the anticipated and unexpected problems and opportunities that arise in research.

The concluding Review of Reviews touches on several novel items, including books on drugs for the laity, data bases for information retrieval, several monographs, and two new editions of pharmacology textbooks. Way's broad knowledge of phar-

macology and special expertise in narcotic drugs make this an interesting chapter.

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Strategy in Drug Research. Pharmacochemistry Library. Volume 4. Edited by J. A. Keverling Buisman. Elsevier, New York. 1982. viii + 420 pp. 17 × 25 cm. ISBN 0-444-42053-3. $76.75.

This book is Volume 4 in the *Pharmacochemistry Library* series. It represents the proceedings of the IUPAC–IUPHAR Symposium "Strategy in Drug Research" and of a satellite symposium "The Value of Predicitions in Structure–Activity Analysis", which were held in Noordwijkerhout, August 25–28, 1981. The central theme was deftly adhered to by each of the approximately 20 contributing lecturers who summarize research from their own areas of expertise. After an opening lecture that discusses "Drugs for Developing Countries", three presentations describe efforts to characterize drug receptors. The benzodiazepine receptor, the GTP-regulatory receptor associated with β and α_2 systems, and a promising α_2-receptor affinity label are discussed. A lecture concerning the development of peptide drugs then provides a smooth transition to three papers that describe enzymes as targets in drug research. An interesting general classification for these targets is suggested, as well as specific treatments of enzyme-activated irreversible inhibitors and the potential of selective MAO-B inhibition to improve the quality of life in senescence. As the proceedings turn to consider drug metabolism, alternative soft-drug and metabolic stabilization approaches both receive attention. Two additional lectures discuss the importance of structure–pharmacokinetic relationships and drug biotransformation in drug design. A lecture at this point discusses many of the previous topics within the framework of a program concerned specifically with sickle cell anemia. The interplay between drug and various α-receptor populations is discussed prior to two papers dealing with the use of computers in drug design. A brief wrap-up of the symposium is provided before the lectures associated with the satellite symposia are presented. An interesting review of antihistamine QSAR and the potential of gaining new leads from diagnosis of outlier or exceptions in QSAR determinations are among these final four lectures.

The book contains a subject index with topics and drugs arranged in a pharmacological classification. The specific subject treatments are best described as general reviews where authors have emphasized the rationale for their programs and/or approaches toward drug design. Although the book represents enjoyable reading, it would seem to be more appropriately housed in a library rather than as a personal copy.

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Biochemical Structure Determination by NMR. Edited by Aksel A. Bothner-By, Jerry D. Glickson, and Brian D. Sykes. Marcel Dekker, New York and Basel. 1982. xi + 232 pp. 15.5 × 23 cm. ISBN 0-8247-1564-0. $45.00.

Nuclear magnetic resonance (NMR) spectroscopy has been and will increasingly continue to be a very important tool in the elucidation of the structure and physical–chemical properties of materials of biological origin. This book consists of the expanded versions of papers that were presented at the Robert Rowand III Memorial Symposium, held at Carnegie-Mellon University in Pittsburgh on September 15, 1979. Since Robert Rowand III's chief interests lay in the field of biochemical structure determination by NMR, it is only fitting that a symposium in the frontiers of this field be held in his memory.

The book contains a short biography of Robert Rowand III and eight contributed chapters describing recent advancements of NMR spectroscopy for obtaining structural and physical–chemical information from a variety of biochemical systems. The chapter topics (and authors) are as follows: (1) "Motions of Aliphatic Residues in Myoglobins" (F. Gurd, R. Wittenbort, M. Rothgeb, and F. Neireiter, Jr.); (2) "Studies of Chlorophyll-a in Model and Natural Membrane Systems" (K. Eigenberg, W. Croasmum, and S. Chan); (3) "^{25}Mg NMR Applications to Problems in Biophysical Chemistry" (D. Rose, P. Tovo, R. Bryant, M. Bleam, and T. Record, Jr.); (4) "Elucidation of Metallothionein Structure by ^{113}Cd NMR" (J. Otvos and I. Armitage); (5) "Ligand–DNA Interactions in Solution with Aromatic and Steroid Diamine Complexes" (D. Patel); (6) "Properties of the Phosphodiester Backbone of Duplex DNA and Filamentous Bacterophage DNA" (S. Opella and J. DiVerdi); (7) "Elucidation of the Susceptibility Tensor of Yb^{+3} in Carp Paralbumin" (L. Lee and B. Sykes); and (8) "Structural Studies on High Affinity Ca^{+2} Binding Proteins, Skeletal Troponin-C and Brain Calmodulin" (K. Seamon). These chapters describe the application of a broad range of NMR techniques, for example, the interpretation of NMR relaxation data, the use of solid-phase NMR, the NMR of quadrupolar nuclei and metal ions, and the study of lanthanide-induced shifts, in addition to the more classic NMR methodologies. The contributors are well known in their fields of research, and the chapters are concise, well written, and informative. A relatively complete subject index is included. The most significant drawback of this book is that it is largely dated by 2 years.

This volume should not be mistaken by its title for a comprehensive text describing the use of NMR methods and theory as applied to biochemical structure determinations. Instead this volume presents a somewhat limited view of the progress that had been made in the study of biochemical systems by NMR. This book will be of greatest use for the person interested in the specific biochemical areas covered and for the biological NMR spectroscopist for reference.

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Photochemistry. Volume 12. Specialist Periodical Reports. By D. Bryce-Smith, Senior Reporter. The Chemical Society, London. 1982. xxix + 587 pp. 14.5 × 22 cm. ISBN 0-85186-105-9. $145.00.

This volume comes hard on the heels of Volume 11, which represents a major advance in bringing this series up-to-date. This volume covers the literature in photochemistry between July 1979 and June 1980, and the editors are aiming with Volume 13 to achieve the original objective of publication within 1 year of the end of the period under review. Once again, the quality of the reviews and of the production of the book is first rate, and the book remains indispensable reading for anyone with an interest in any aspect of photochemistry. However, most medicinal chemists will probably not derive much direct benefit from this volume unless their work involves photolabile materials, photoaffinity labeling of biologically active systems, or synthesis of compounds of medicinal interest by photochemical techniques.

The chapter on "Photochemical Aspects of Solar Energy Conversion" by L. M. Peter, a new addition to the team of reporters, was especially interesting and very well written. There were a number of important advances in this field during the periods under review, and many chemists, regardless of their area of interest, should find this subject of interest on scientific as well as cultural grounds.

It is gratifying that the price of this volume has not been increased over that of its predecessor, although it should be noted that this volume is thinner by nearly 100 pages. This is scant comfort to most photochemists, who will surely find this volume (as the previous one) much too expensive for inclusion in their personal libraries and will depend on institutional library acquisitions to make the book available. As mentioned in the

previous review, I hope that this valuable series will not succeed in pricing itself out of existence.

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Calculator Programming for Chemistry and the Life Sciences. By Frank H. Clark. Academic Press, New York. 1981. vii + 226 pp. 16 × 23.5 cm. ISBN 0-12-175320-4. $24.50.

This book covers the following four basic areas: calculation of molecular formulas, coordinate transformations, potentiometric titrations, and correlation analysis. The programs in this book make full use of the Texas Instruments TI-59 programmable calculator and the PC100A printer attachment. The owner of a Texas Instruments TI-59 programmable calculator or a Hewlett-Packard HP-41C will find that the corresponding instruction manual fully explains the elements of calculator programming, including the use of decision maps. Some of the programs can be used without the printer, but most of them are so complicated that the printer is required to use them to their best advantage. Many of the programs are complex—one uses 79 data storage memories, most of them several times over during a calculation. The iterative programs may require 30 min or so to reach an answer that is finally printed. In this case, there are built-in safeguards, such as the flashing of interim results that ensure the user that a solution to the problem is being approached. Some of the programs require use of the Master Library Module of the TI-59 calculator for performing matrix operations.

Chapter 2 includes a program to allow comparing the three-dimensional coordinates of two molecules using least-squares fit. Another program transforms X-ray crystallographic coordinates to orthogonal coordinates. The program provides for a change of scale, relocation of the origin of the coordinate system, and reorientation of the molecule to a newly defined position. A third program provides data regarding the interrelationships of the atoms in a molecule.

Chapter 3 contains programs for calculating pK_a and equivalent volume by iteration, partition coefficient, and titration curve plotting.

Chapter 4 includes programs for correlation anaysis with two through five variables. Regression coefficients are provided, together with their 95% confidence limits. The programs calculate the Student's t value. The correlation coefficient and the F value are also obtained. Provision is made for the addition and subtraction of data points. A special feature is the provision for converting trivariate data to any of three combinations of bivariate data. A program is also provided for solving the bilinear equation of Kubinyi.

The reader of this book must have a high motivation and a lot of patience in order to punch in up to a 450-step program without error and then carefully follow the directions for entering data and reading out the appropriate resulting answers. For those readers without access to larger computing facilities, this book contains a lot of valuable and tested programs.

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Books of Interest

Handbook of Enzyme Inhibitors (1965–1977). By Mahendra K. Jain. Wiley, New York. 1982. ix + 447 pp. 22 × 28.5 cm. $100.00.

Biological Activities of Polymers. ACS Symposium Series. Number 186. Edited by C. E. Carraher, Jr., and C. G. Gebelein. American Chemical Society, Washington, DC. 1982. x + 293 pp. 16 × 23.5 cm. $31.95.

Methods of Biochemical Analysis. Volume 28. By David Glick. Wiley, New York. 1982. viii + 430 pp. 15.5 × 23.5 cm. $45.00.

Inorganic Biochemistry. Volume 3. Specialist Periodical Reports. H. A. O. Hill, Senior Reporter. Royal Society of Chemistry, Burlington House, London. 1982. xv + 397 pp. 14 × 22.5 cm. $114.00.

Antiepileptic Drugs. Second Edition. Edited by D. M. Woodbury, J. K. Penry, and C. E. Pippenger. Raven Press, New York. 1982. xvii + 879 pp. 18.5 × 26 cm. $65.00.

Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. Eighth Edition. Edited by R. F. Doerge. Lippincott/Harper, Philadelphia. 1982. xiv + 876 pp. 22 × 28.5 cm. $47.50.

The Role of Tamoxifen in Breast Cancer. Edited by S. Iacobelli, M. E. Lippman, and G. R. Della Cuna. Raven Press, New York. 1982. xii + 124 pp. 16 × 24 cm. $17.00.

Terpenoids and Steroids. Volume 11. Specialist Periodical Reports. J. R. Hanson, Senior Reporter. Royal Society of Chemistry, Burlington House, London. 1982. xi + 243 pp. 14.5 × 22.5 cm. $94.00.

Experimental and Clinical Psychiatry. Volume 7. The Behavior of Psychiatric Patients. Quantitative Techniques for Evaluation. Edited by I. I. Burdock, A Sudilovsky, and S. Gershon. Marcel Dekker, New York. 1982. xvi + 583 pp. 15.5 × 23.5 cm. $69.50.

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