

BOOK REVIEWS

A Guidebook to Mechanism in Organic Chemistry, Sixth Edition. P. SKYES. Longman Scientific and Technical, co-published in the U.S. by John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158, 1986, xii+416 pp., 14×21.5 cm., \$21.95.

The reviewer confesses that he has a special affinity for this book, since its first edition was based on the contents of a course of lectures which he took from Dr. Skyes in 1958. Dr. Skyes was (and is) a clear and vivid lecturer, and his clarity of presentation is maintained in this excellent book which discusses the mechanisms of organic reactions.

The book is aimed primarily at students, and is, as its name implies, a guidebook rather than a reference book. It thus has no references and no problem sets but instead relies on an extensive bibliography for the student interested in learning more. The book begins with two chapters on the basic principles of physical organic chemistry and one on acids and bases and then proceeds to discuss the major classes of ionic organic mechanisms in the next seven chapters. The final three chapters treat free radical reactions, symmetry controlled reactions, and linear free energy relationships.

The level of presentation is appropriate to an advanced undergraduate course in organic mechanisms, but the book will also be useful to graduate students and others who desire a good review of mechanistic organic chemistry. The presentation is clear and up-to-date with subjects such as *ipso* aromatic substitution and the mechanistic borderline in nucleophilic substitution being included in this edition. The overall quality of the book is evidenced by the fact that this is the sixth English edition with translations into seven foreign languages and two more in preparation. It is highly recommended.

DAVID G.I. KINGSTON, *Virginia Polytechnic Institute and State University*

The Chemistry and Biology of Isoquinoline Alkaloids. Edited by J.D. PHILLIPSON, M.F. ROBERTS, and M.H. ZENK. Springer-Verlag New York, Inc., 1985, vi+304 pp., 24½×16½ cm., \$39.

This book is not what I expected from its title, namely a survey covering the different subgroups of isoquinoline alkaloids. Instead, it is a collection of disparate and only loosely connected lectures, arranged in no logical order, given at a symposium in London in 1984. I have never been able to understand the desire to publish collected proceedings at symposia at which the lecture format and particularly the time limits imposed on lecturers, results in the presentation of much material of very restricted scope often of such highly topical nature that it is outdated or no longer exciting by the time it finally appears in print. Symposia are excellent meeting grounds for the generation of discussion and the stimulation of new ideas, but the proceedings lack both urgency and depth when published in book form and those presented in this book are no exceptions to this generalization.

That said, however, I did find almost all of the contributions very well written and instructive, though that concerned with the structure activities and pharmacological properties of the opium alkaloids is too sketchy to be of much value. Most are informative to the non-specialist but probably contain nothing new to the specialist, and all give substantial guides to further and more detailed study. Only a limited number of the subgroups of isoquinoline alkaloids are considered in sections ranging from the occurrence of alkaloids in plants, production of them in cell cultures, biosynthesis, commercial synthesis, natural degradation, spectroscopic methods in the elucidation of structure to the pharmacological properties of some alkaloids.

There is enough of value in the volume to make it a useful addition to a library, but perhaps not enough for personal expenditure.

K.W. BENTLEY, *Loughborough University of Technology*

Chemotaxonomie der Pflanzen. Vol. 7. R. HEGNAUER. Birkhäuser Verlag, Basel, P.O. Box 133-CH 4010 Basel, Switzerland, 1986, 804 pp., 24×15.7 cm., 460 sFr.

The series *Chemotaxonomie der Pflanzen* has long been recognized as the authoritative work on plant chemosystematics. The first six volumes of the series deal with most plant groups and the relation of plant chemistry to taxonomic and phylogenetic problems within these taxa. This new addition, vol. 7, follows suit, but several interesting new features have been added.

The first portion of the volume (pp. 10-205) is an extended bibliography of a number of subjects, all related to plant compounds, their rôles in plants, and plant systematics and phylogeny. Emphasis has been on more recent references, but significant older references are included. Topics covered are: systematic and anatomical publications, the distribution and chemistry of plant compounds (including carbohydrates, lipids, amino acids, terpenes, essential oils, carotenoids and polyterpenes, glycosides, polyphenols, aromatic acids and coumarins, phenylpropanoids, flavonoids and xanthenes, tannins, quinones, secondary nitrogen containing compounds, sulfur containing compounds, acids, inorganic materials and organic halogenated compounds, and selenium containing compounds), classes of substances defined by their properties (plants with antibiotic, contraceptive, hypoglycemic activity, bitter principles, dyestuffs, hallucinogenic activity, those that produce dermatitis, insecticides, molluscicides, piscicides, sweeteners, and tumor inhibiting and promoting substances), phytochemical surveys, publications on useful, medicinal, and poisonous plants, and chemical ecology. The last of these categories is subdivided by the classes of compounds involved and includes alkaloids, other nitrogen containing compounds, fatty acids and related compounds, lactones, aromatic compounds, coumarins, flavonoids and chalcones, tannins, quinones, iridoids, mono-, sesqui-, and diterpenes, steroids and triterpenes, saponins, and animal hormones and antihormones from plants. Other topics related to chemical ecology are allelopathy, phytotoxins, preformed plant resistance factors, and phytoalexins. References on chemotaxonomic works follow.

The next part of the book (pp. 207-297) includes specialized chemotaxonomic treatment of the algae, euglenas, fungi, lichens, and other lower organisms.

Subsequent to this (pp. 297-373) is a series of reviews of types of compounds that serve as important chemical characters for the chemotaxonomic study of plants other than algae. These include: calcium oxalate, cell inclusions, tannins, alkaloids, iridoids, and cyanogenic compounds.

The last segment (pp. 374-794) presents updated chemotaxonomic treatments of plant groups beginning with the bryophytes, psilophytes, ferns and fern allies, and gymnosperms and concluding with the monocots.

Thus, the volume is a valuable bibliography of phytochemistry, chemosystematics, chemical ecology, economic botany, and a number of other subjects, but presents worthwhile, chemotaxonomically oriented reviews of several groups of plant secondary compounds, and chemotaxonomic treatments of fungi, algae, bryophytes, pteridophytes, gymnosperms, and monocotyledonous angiosperms. That is a wealth of information to pack into one volume!

As one would expect, the volume is well written. Although in German, much of the information is accessible to those with minimum language capability. There are amazingly few typographical or other errors. There is no index, but little problem is encountered in locating pertinent information. In any case, a complete index would probably double the size of the work.

This work will be of interest to many workers in numerous fields. As is true of the first six volumes of the series, this volume promises to be the standard work in this area for many years. The cost will prevent many individuals from acquiring it, but it definitely should be available in scientific libraries.

DAVID S. SEIGLER, *University of Illinois*

Nuclear Magnetic Resonance-Basic Principles. ATTA-UR-RAHMAN. Springer-Verlag, New York, Inc., 175 Fifth Avenue, New York, NY 10010, 1986, x+358 pp., 23.5×16 cm., \$59.

The volume is presented as five chapters followed by appendices containing problems and answers and an index. Chapters I and II, "Chemical Shift in ¹H-NMR Spectroscopy" and "Spin-Spin Coupling in ¹H-NMR Spectroscopy", respectively, provide adequate compendia of information of standard scope and are essentially comparable to numerous other treatments. The third chapter, "Experimental Procedures in NMR Spectroscopy," attempts to present Fourier transform techniques but does so, in the opinion of this reviewer, in a fashion which would be difficult for most students to follow easily. For example, homonuc-

lear proton decoupling is followed by off-resonance heteronuclear decoupling, after which the author jumps back to nuclear Overhauser enhancement before continuing to heteronuclear gated decoupling and then spin relaxation. With regard to the latter topic, only T_1 inversion recovery and T_2 Carr, Purcell, Meiboom, and Gill methods are discussed, providing a cursory treatment which is likely to be of limited value to more advanced students. Chapter IV, entitled, "Chemical Shifts and Spin-Spin Couplings in ^{13}C -NMR Spectroscopy" appears to represent largely an amalgamation of liberally borrowed materials contained in earlier monographs by Levy and Nelson and Wehrli and Wirthlin and various reviews. The treatment has nothing to recommend it over earlier volumes. Chapter four concludes with a very brief section on solid nmr and the mention of nmr imaging, neither of which adds much of value to the volume. Throughout the first four chapters, most spectral examples used appear to be hand drawn, are of disappointingly poor quality, and are incorrect in some instances.

Chapter V, entitled "Special Pulse Sequences and Two-Dimensional NMR Spectroscopy" presumes to treat an exceptionally important area of contemporary nmr spectroscopy which warrants more detailed comment. Coverage reasonably begins with spin echo based experiments, SEFT and APT and then progresses into the cross polarization based INEPT and DEPT experiments. These topics are treated adequately. Carbon-carbon one dimensional INADEQUATE is presented next in a woefully inappropriate fashion using vector diagrams, followed by selective excitation using DANTE sequences which is accorded only cursory treatment. Two-dimensional nmr techniques are then introduced, and while there is a need for an introductory text on the subject, this volume falls far short of satisfying that need. Special examples taken from the literature are reproduced, for the most part, as poorly hand drawn reproductions without the courtesy to the original authors of citing the origin(s) of the material at the point of appearance. 2D- J resolved experiments are described first which is an appropriate beginning from which to illustrate the partitioning of information between the two time and, subsequently, the frequency domains. Although 2D- J techniques are presently of limited utility, they occupy more space than the heteronuclear chemical shift correlation experiments which are considerably greater import. Treatment of heteronuclear chemical shift correlation, unfortunately, is rather poor and likely to be difficult for a student to grasp. Proceeding from direct ($^1J_{\text{CH}}$) to long range ($^nJ_{\text{CH}}$, $n=2-4$) heteronuclear correlation, a topic which represents >50 papers and numerous techniques, the author treats only one experiment, COLOC, and does so in barely one page of text! Treatment of the autocorrelated proton or COSY experiments is of comparable quality; homonuclear zero quantum coherence is inexplicably inserted between the COSY techniques and a discussion of the SECSY experiment. NOESY, a technique widely used for biopolymers, is treated cursorily before progressing to relayed coherence transfer techniques. In regard to the latter, heteronuclear relay is discussed and examples shown while the potentially far more important homonuclear variant is never mentioned. Finally, the author returns to multiple quantum experiments, attempting to describe first one of the two-dimensional carbon-carbon experiments. Inexplicably, the text next goes on to two-dimensional double quantum coherence echo correlated spectroscopy (DECSY), a proton technique reported once in 1984, without ever bothering to mention the important proton double quantum INADEQUATE experiment which must be understood before the former can even be considered.

In summary, the last chapter on contemporary nmr experiments fails to satisfy the need for an introductory level treatment of 2D nmr which goes beyond the scope of already available reviews such as those by Benn and Gunther [*Angew. Chem., Int. Ed., Engl.*, **22**, 350-380 (1983)] or Morris [*Magn. Reson. Chem.*, **24**, 371 (1986)]. Overall, there appears to be little to recommend the volume over existing monographs, especially in view of quality of the illustrational material and the price.

GARY E. MARTIN, *University of Houston*

Abstracts of Chinese Medicines, HSON-MOU CHANG, Editor-in-Chief. Chinese Medicinal Material Research Centre, Te Chinese University of Hong Kong, Shatin, New Territories, Hong Kong. \$120 per annum.

This new quarterly journal intends to make information on Chinese materia medica available on a continuous basis to readers of English by translating recent significant Chinese papers into English abstracts. More than 100 Chinese medical and scientific journals not readily available outside China will be abstracted. The first issue (October 1986) contains 372 abstracts and three review articles.

New Trends in Natural Products Chemistry 1986. Edited by ATTA-UR RAHMAN and PHILIP W. LEQUESNE. Elsevier Science Publishers, Amsterdam, The Netherlands, 1986, xiii+674 pp., 17×24.5 cm., \$148.

This volume is a collection of forty-four papers presented at the Second International Symposium and Pakistan-U.S. Binational Workshop on Natural Products Chemistry held in Karachi, Pakistan in January, 1986. The papers, between 8 and 26 pages in length, cover a wide variety of topics in natural products chemistry including the isolation and structure elucidation of primary and secondary metabolites from plants, animals, and marine organisms, the synthesis of complex natural products, instrumental techniques such as x-ray diffraction and the use of circular dichroism to determine stereochemistry, and some topics of biochemical interest. All of the papers are written in English and are, for the most part, very well written. The papers are organized alphabetically by the last name of the principal author. This organization detracts somewhat from the usefulness of the book, in my opinion, since the papers related to a single topic such as synthesis are not collected in one section. For example, two papers on *Thalictrum* alkaloids, which when read sequentially make a good review of the area, are separated by 100 pages.

There is, as might be expected from a broadly based conference, variation from paper to paper in the depth and usefulness of the information presented. A few papers present experimental details although most of these details are available in the references cited. Of more value is some of the nmr data presented. In the five papers devoted to different aspects of triterpenoid chemistry, in particular, there is a large amount of both ^1H -nmr and ^{13}C -nmr data. A paper on methods for structural studies of carbohydrates shows, by the use of several sample spectra, the advantages that two-dimensional nmr techniques can provide to the natural products chemist, and another paper introduces the technique of continuous flow ^{13}C nmr for the study of ^{13}C labelled metabolites. This latter paper should be of particular interest to chemists and pharmacologists studying drug metabolism.

In addition to the papers which show extensive use of nmr spectroscopy, several other spectroscopic methods are addressed. There is one paper devoted to the use of X-ray diffraction to elucidate the structures of marine natural products which not only presents some successfully solved structures but also addresses some of the problems encountered in the technique. A paper on the use of circular dichroism to determine the absolute configuration of natural products reinforces the value of this often overlooked technique.

Thirteen of the papers are devoted to the synthesis of natural products. The synthetic targets include gelsemine, vinblastine alkaloids, adriamycin, halogenated marine natural products, amino sugars, polyenes, and peptides among others. The use of chiral cyclopentane derivatives and chiral indole alkaloids as building blocks for complex natural products is presented in one paper, while another presents the use of silicon-containing allyl and homoallyl cations in an approach to the synthesis of arachidonic acid metabolites. Overall, the papers devoted to synthesis are diverse and timely.

The editors of this volume are to be complimented for the timely publication of the collection of papers. Normally such books are published well after the information included has been presented in other formats or is out of date. Certainly many of the papers represent the current state of research of the authors, and as such, should be of considerable interest to other researchers in the area. However, the high price of this volume will undoubtedly restrict it to library bookshelves where it will be available to a wider audience.

ALBERT T. SNEDEN, *Virginia Commonwealth University*

Handbook of Northeast Indian Medicinal Plants. JAMES A. DUKE. Quaterman Publications, Inc., P.O. Box 156, Lincoln, MA 01773, 1987, xvi+212 pp., 23.5×16 cm., \$30.

"Lo, the poor Indian! whose untutored mind/ Sees God in clouds, or hears him in the wind;/ His soul proud Science never taught to stray/ Far as the solar walk or milky way;/ Yet simple nature to his hopes has giv'n/ Behind the cloud-tipped hill, an humbler heaven." (Alexander Pope, *An Essay on Man*).

Whether the remedies compiled in this volume have been at all instrumental in prolonging the Indian's earthly existence or, indeed, may have helped him on his way to his humbler heaven, is a question which might be asked of any similar medical folklore. The author attempts to deal with it at some length in an extended introduction although, in this reviewer's opinion, his panegyric in praise of natural drugs is a bit overdone.

The body of the book consists of a listing, alphabetically by Latin name, of some 700 species, many of them illustrated by attractive line drawings. A listing of sources along with indices of common names and, finally, disease states and the plants used to treat them, are appended. The term "Northeastern Indian" as used in the title is to be taken liberally; tribes from the Cree and Cherokee of the southeastern states to the Kwakiutl of the Pacific coast of British Columbia are included. This tidy little volume thus becomes a wel-

come companion to the recent reproduction, by the same press, of *The Medicinal Uses of Plants By The Indian Tribes of Nevada*.

One cannot fault compilation as such; it serves a useful purpose. But among these "Indian remedies" one will recognize many of the old standbys listed in the herbals of the centuries, from the willow bark of Hippocrates to the inevitable ginseng of China, whose constituents, active and otherwise, have been isolated and defined as far as currently available techniques will permit. This is not to say that some of the others should be denied the investigation for which the author pleads. But what does one do with a single plant used by 15 different groups of people for the treatment of over 20 different disease states? The answer, one supposes, lies behind that "cloud-tipped hill."

ROBERT F. RAFFAUF, *Northeastern University*

Bio-Organic Heterocycles 1986-Synthesis, Mechanisms and Bioactivity. H.C. VAN DER PLAS, M. SIMONYI, F.C. ALDERWEIRELET, AND J.A. LEPOIVRE. Elsevier, P.O. Box 1663, Grand Central Station, New York, NY 10163, 1986, xi+325 pp., 25 × 16.5 cm., \$94.

This book contains the 7 plenary lectures and written versions of some 28 posters given at the Fourth FECHM Conference on Heterocycles in Bio-organic Chemistry. This meeting was held in Belgium in May, 1986. The term bioorganic is used in a broad sense, and the topics range from the synthesis of biologically active natural products to completely biochemical studies. However, the synthesis of heterocycles is a common thread running through most of the contributions.

The most interesting lectures at meetings are those that describe work in progress on a difficult problem or announce the completion of a particular project such as a complex synthesis. The benefit of having lectures in printed form is that the reader can get a general view not available elsewhere in the literature. This is especially so nowadays when much research (especially by those who give plenary lectures!) is published only as communications. However, lectures and, even more, poster presentations have an ephemeral quality about them.

The general standard of the lectures was very good. I particularly enjoyed the articles by Mansuy on the use of metalloporphyrins as catalysts and Arcamone on the design and synthesis of anticancer drugs with selective DNA binding properties. Holy's lecture was difficult to follow perhaps because I am outside the field. Battersby's article was the most disappointing, because it was not the actual text but an extended synopsis (of 5½ pages including references) of his lecture. It summarized the major facts established on the biosynthetic pathway to Vitamin B₁₂. There are no structures, and, hence, the article does not stand on its own but is more a guide to the relevant references. However, Battersby has in the last 3 years published reviews of his elegant work elsewhere.

Each lecture is followed by a transcript of the subsequent discussion. I find that these discussions are usually of little value, and I am always surprised when they are included in a book.

The poster presentations vary from 2 to 20 pages. They naturally tend to be narrower in their scope than the lectures, and so their appeal is mainly to workers active in the area.

The book gives a picture of biologically oriented studies of organic heterocycles in European laboratories. It will be of particular interest to those wise synthetic organic chemists who are starting to become interested in the biological aspects of organic chemistry. While I should be surprised if many people would wish to buy this book for their personal use, it should be in libraries.

DESMOND M.S. WHEELER, *University of Nebraska-Lincoln*

Continued from back cover

BRIEF REPORTS

Constituents of the Essential Oil of <i>Calamintha nepeta</i> —C. Souleles, N. Argyriadou, and S. Philianos	510
Flavonoids of <i>Cupressus sempervirens</i> and <i>Cupressus cashmeriana</i> —M. Khabir, Fehmeeda Khatoun, and W.H. Ansari	511
Polyphenols Isolated from <i>Pterocaulon purpurascens</i> , I. 6-Hydroxyflavonoids—S.L. Debenedetti, E.L. Nadinic, M.A. Gomez, and J.D. Coussio	512
Pyrrrolizidine Alkaloids and Other Components of <i>Senecio vira-vira</i> —Elizabeth Jares and Alicia B. Pomilio	514
Volatile Leaf Oils of California Salvias—Kurt R. Neises, Rainer W. Scora, and Junji Kumamoto	515
Alkaloids of <i>Alphonsoea sclerocarpa</i> —Dragana Tacić, G. Percy Wannigama, Bruce K. Cassels, and André Cavé	518
Flavonoids of <i>Cotula cinerea</i> —Ahmed A. Ahmed, Nabil H. el-Sayed, Sabry I. el-Negoumy, and Tom J. Mabry	519
Microbial Transformation of Zearalenone, I. Formation of Zearalenone-4-O-β-glucoside—Saleh el-Sharkeaw and Yusuf Abul-Hajj	520
Heliangolides from <i>Stevia origanoides</i> —J.S. Calderón, L. Quijano, F. Gómez, and T. Ríos	522
Erratum	523
Book Reviews	524