

## Book Reviews

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## BOOK REVIEWS

*Asymmetric Synthesis of Natural Products.* ARI M.P. KOSKINEN. John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England. 1993. xiii + 234 pp. 18.5 × 24.5 cm. \$39.95. ISBN 0-471-938483.

This is an excellent "Lecture Notes" volume on the asymmetric synthesis of natural products. This book is written based on a one-semester, 24-hour lecture course intended for senior undergraduate and beginning graduate students in Finland and England. Indeed, this book appears quite appropriate for a graduate course in the United States as a textbook. This book can also be used as a reference work for special topics courses in some schools as well as for chemists in industrial laboratories. The book covers a wide range of different natural products, indicating their basic functions in biology and potential and practical use as medicine. The selection of natural products and their syntheses includes those of current research interests so that graduate students, as well as laboratory chemists in industry, can obtain an up-to-date overview of this field. The thrust of the organization of this book is the combination of chapters discussing basics and modern methods of asymmetric synthesis (Chapters 2 and 3) and those describing each class of natural products, i.e., carbohydrates (Chapter 4), amino acids, peptides and proteins (Chapter 5), nucleosides, nucleotides and nucleic acids (Chapter 6), polyketides (Chapter 7), isoprenoids (Chapter 8), shikimic acid derivatives (Chapter 9), and alkaloids (Chapter 10). Chapters 2 and 3 include nice examples of useful methods for asymmetric synthesis with clear illustrations. Chapter 5 could have included the description of the inhibitors of angiotensin-converting-enzyme (ACE), renin, and HIV protease I, which are major recent developments in medicinal chemistry. Chapter 6 is very short and lacks an appropriate illustration for "intercalation." Chapter 8 is well written, but it could have included compactin. The reference citation is generally good, especially for Chapters 2 and 3, which include quite recent reports up to early 1992. However, the literature coverage for each natural product class is not necessarily satisfactory; for example, Chapters 6 and 9 do not have references. It would have been better if relevant reviews on these topics were provided. This comment is also applicable for other chapters. Overall, in spite of these rather minor flaws, this is an excellent reference text for graduate students, postdoctorals, and laboratory chemists in industry wishing to learn modern natural products synthetic chemistry.

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*Studies in Natural Products Chemistry, Volume 13. Bioactive Natural Products (Part A).* Edited by ATTA-UR-RAHMAN and F.Z. BASHA. Elsevier Science Publishing Company, Inc., PO Box 945, Madison Square Station, New York, NY 10160. 1993. xiii + 694 pp. 16.5 × 24 cm. \$356.50. ISBN 0-444-89937-5.

Volume 13 of Atta-ur-Rahman's *Studies in Natural Products* covers in 14 chapters a wide range of natural products with the stress on compounds with actual or potential biological activity. The authors are well-known natural product chemists. The chapters, written by Paquette, Thomas, Ogawa, Cook, Fukuyama, Specman, and Rosen, are devoted to total syntheses and include discussions of terpenoids, products from microorganisms, carba-sugars, various families of alkaloids, carbapenems, and amino acids. Frauendorf and Engels discuss automated syntheses of antisense oligonucleotides as potential drugs. Su and Watabane cover acridone alkaloids with stress on anticancer compounds. Savard and Apsimon review recent work on non-trichothecene secondary metabolites obtained from *Fusarium* species.

Ihara and Fukumoto describe asymmetric syntheses of bioactive natural products from chiral propane 1,3-diols. Larrey and Perun discuss various synthetic modifications of erythromycin A. Fuganti and his coworkers describe the production of flavors largely through the action of micro organisms. The final chapter, written by Cordell, is a general survey of pharmacognosy past and present and should be of particular interest to all chemists interested in natural products with pharmacological activities.

Obviously, all authors discuss their work, but all, except Paquette's chapter, provide general views of their topics. Fukuyama describes earlier syntheses of mitomycins, but the stress is on his interesting work. In general, the authors do an excellent job in presenting their material. However, I found the chapter on carba-sugars heavy going. There are over 400 structures in the chapter. Structure numbers from earlier pages frequently appear later and so one has to flip back to discover the structures of those compounds. In addition to Cordell's chapter, I particularly enjoyed those of Frauendorf, Fuganti and Rosen. However, all of the chapters contain interesting chemistry. This book is worth reading because its wide coverage of natural products extends beyond just total syntheses. The book ought to be in every institutional library, though its price will hinder the number of sales to individuals.

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*Murder, Magic, and Medicine.* JOHN MANN. Oxford University Press, Walton Street, Oxford OX2 6DP. 1992. 232 pp. 15.5×23 cm. \$29.95. ISBN: 0-19-855561-X.

When I began to read this book I had the opinion that it was going to be another one of those "why don't we give the natives in the field the credit they deserve for discovering all the important drugs" books. I soon found that I was wrong. This is an entertaining book that is very well crafted by an author who has a talent for story telling. His style of writing provides both information and entertainment. The author has a very well developed, low-key sense of humor that I found refreshing. Although intended for a general audience, the book in no way minimizes or trivializes the science involved in drug discovery. I was particularly impressed with the author's introduction of very basic pharmacology prior to discussing a particular group of agents. On the other hand, the well-drawn ball-and-stick chemical structures—which provide the intended graphical comparison of molecules—might put off some readers.

While many readers will find "old friends" among the stories told, there are some that will probably be new. For example, relationship of witchcraft to the use of hallucinogenic "flying" ointments containing *Datura* extracts is new to this reviewer. In following his intended outline of showing how natural drugs were often used first for murder (both socially acceptable and not) then as a part of ritual (magic and religion) and then, finally, legitimate medicine, the author weaves a tale that provides a fascinating insight into drug discovery. Those involved in the teaching of natural products courses at both the undergraduate and graduate levels will find many facts and bits of information that can be used to add color to their presentation. It is nice to find in one place all of those stories that we have heard and would like to refer back to when preparing a talk or lecture. The bibliography provided at the end of the book is a valuable resource.

I found this book to be both informative and entertaining, and I recommend it to anyone who wants to know something about how drugs are discovered. The book should be a pleasant surprise to those who take the time to read it.

JOSEPH E. KNAPP, *University of Pittsburgh*

*Non-Timber Products from Tropical Forests: Evaluation of a Conservation and Development Strategy.* (*Advances in Economic Botany Vol. 9*). Edited by DANIEL C. NEPSTAD and STEPHAN SCHWARTZMAN. The New York Botanical Garden, Bronx, New York, 10458. 1992. 164 pp. 16.5×25 cm. \$18.95. ISBN 0-89327-376-7.

This volume consists of the proceedings of a symposium held in Washington, D.C., in 1989. The editors, Dr. Daniel Nepstad of the Woods Hole Research Institute and Dr. Stephan Schwartzman of the Environmental Defense Fund, are themselves pioneers in the field of Amazonian development and conservation and have done an excellent job of organizing and presenting the symposium results. They have divided the proceedings into several sections focusing on the biological, socioeconomic, and political contexts and include useful subsections on both the barriers to expanding NTFP (non-timber forest product) extraction as well as the strategies for expanding NTFP extraction. Although most of the papers focus on the Brazilian Amazon, case studies on West Africa and Indonesia are presented for comparative purposes.

Although NTFPs have been regarded by some as the panacea for solving the problems inherent in making economic development and rain forest conservation mutually complementary, the results presented in this volume make clear the many difficulties inherent in trying to build sustainable systems of forest utilization based on this type of approach. For example, the paper by Nepstad *et al.* notes that although utilization of NTFPs have often been proclaimed as the best way to sue the forest without destroying it, improper harvesting of these products can seriously degrade the ecosystem. Browder opines that the extraction of these products is seldom attractive from an economic standpoint and that the capability for change in terms of expanding existing markets or finding new ones is severely limited.

Yet not all the papers are pessimistic. Schwartzman argues that helping extractors gain title to the lands they manage not only improves protection and management of the forest but helps the local people as well. Clay takes issue with Browder's belief that markets can seldom be expanded, citing results achieved with Brazil nuts and other Amazonian commodities during his years at Cultural Survival.

In conclusion, this volume contains a wealth of intriguing data not found anywhere else. Although it contains little data on the value or potential value of medicinal plants, it still must be regarded as a standard reference for anyone interested in rain forest conservation and development.

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*Organic Syntheses, Vol. 71.* Edited by L.E. OVERMAN. John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158. 1993. xxxiii+285 pp. 15×23 cm. \$39.95. ISBN 0-471-30531-6.

This is Volume 71 in the well respected series *Organic Syntheses* (OS), edited this time by Larry E. Overman. Thirty synthetic methods are presented following the familiar OS format of succinct experimental procedures supplemented by detailed comments on alternative procedures, unusual apparatus, hazards, sources of starting materials, and some commentary about the utility of the protocol or product. As usual, the coverage of topics is broad but always reflects contemporary synthetic organic chemistry. Because each preparation method is well accompanied with references, it is simple to trace a useful reagent or transformation to its primary source.

The book commences with seven useful protocols for the preparation of enantiomerically pure chiroins whose applications range from conventional derivatization to electrocyclic reactions. The extensive experience of the authors in the subject areas is clearly evident. The next section (eleven procedures) illustrates the increasingly pre-eminent role played by newer organometallic reagents in the preparation of complex chemical structures. Issues of versatility and stereocontrol via chromium, zirconium, palladium, and stannane intermediates are highlighted.

The central theme of the next eight experimental procedures lies in the development of general synthetic methods. These cover benzoannulation of ketones, intramolecular ene reactions leading to 1,2-disubstituted cyclohexanes, and exploitation of the inverse electron demand Diels-Alder reaction. Also covered in this ground is the selective oxidation of primary alcohols using a heterogeneous oxidant. The last four entries are concerned with the preparation of key intermediates and their application to pericyclic processes, as protecting groups, and for the Nazarov annulation. Finally, there follows at the end 33 unchecked experimental procedures well worth a leisurely browse.

Overall, the book provides a large variety of modern, reliable chemical transformations of high quality and would be an asset to any practicing synthetic organic chemist. Given its modest price, it should find a place in most personal libraries.

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