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Book Reviews

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BOOK REVIEWS

Organic Syntheses Collective Volume 8. Edited by JEREMIAH P. FREEMAN. John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158. 1993. xvii+696 pp. 15×22.5 cm. $59.95. ISBN 0-471-58565-3.

In my review of *Organic Syntheses Reaction Guide* by Liotta and Volmer, two years ago in this forum, I wrote "there is no more valuable resouce to the practicing synthetic organic chemist than *Organic Syntheses*. This venerable series, now in its 70th year, describes detailed procedures for the preparation of numerous organic compounds." Nothing in the present *Organic Syntheses Collective Volume 8* changes my opinion of this outstanding series.

The wise decision has been made to publish the Collective Volumes every five years rather than every ten, and Volume 8, as stated in the Preface, "contains procedures previously published in annual volumes 65–69 (1987–1990) but revised and updated in the light of experience and advances since their first appearance." The Table of Contents is arranged alphabetically by title compound and the book contains the usual useful complement of detailed indices {Type of Reaction, Type of Compound, Formula, Author, General, Hazard, and Waste Disposal, and Concordance (with the annual volumes)}. The present volume continues to highlight laboratory safety and to delineate possible chemical hazards, but the Hazard and Waste Disposal Index seems less complete than in previous volumes. For example, propyl iodide—like probably all S_N2 substrates—is not listed as a cancer suspect agent in the index, but is so in the text. Moreover, the proven carcinogen methyl iodide is not identified as such either in the index or in the text. This is puzzling, since detailed warnings are provided about methyl iodide in nine different places in Collective Volume 6. This reviewer considers methyl iodide, which causes massive sarcomas in rats, to be more of cancer peril to chemists than benzene.

There are 149 synthetic procedures, all of which have been reproduced in independent laboratories, and many of which are multi-step (e.g., the six-step syntheses of a pyrrolidine chiral auxiliary on p. 26, and of *trans*-3-methyl-2-vinylcychohexanone on p. 479) and/or multi-example (e.g., the six cyclobutenones on p. 85, and the Pd-catalyzed reduction of numerous vinyl triflates on pp. 129–130). In addition, many of the entries feature improved preparations of useful reagents (e.g., Zn/Cu couple, *N*-chloromorpholine, 2-lithiofuran, *N*-fluoropyridinium triflate, lithium acetylide, and aryl zinc reagents). Each detailed experiment is accompanied by precise Notes, including key spectral data and sources of chemicals, followed by a Discussion and References. *Organic Syntheses* is renowned among practicing organic chemists for its wealth of useful tips for the purification of solvents, reagents, and gases, for waste disposal procedures, and for the introduction and use of novel apparatus (e.g., the phosphorus hydride scrubber on p. 49, and the lithium acetylide generator on p. 393), and Volume 8 is no exception. The drawings of formulas and apparatus are excellent, and the book is of the usual sturdy Wiley caliber.

In summary, this volume is an indispensable addition both to the shelves of practicing synthetic organic chemists and to chemistry libraries. Indeed, *Organic Syntheses* is to the organic chemist what Roget's Thesaurus is to the writer.

GORDON W. GRIBBLE, *Dartmouth College*

The Pill, Pygmy Chimps, and Degas' Horse. CARL DJERASSI. Basic Books, 10 East 53rd Street, New York, NY 10022. 1992. viii+319 pp. 15.5×23 cm. $25.00. ISBN 0-465-05759-4.

The fact that a natural products chemist specializing in steroids could have had a greater influence on the social history and mores of the people of the world than almost any other living person is interesting. When such a brilliant person writes an extremely candid autobiography containing much reflective thought as well as historical data, it becomes even more interesting. Consequently, one is tempted just to say that Carl Djerassi has expanded some of his magazine articles and incorporated additional material into a truly fascinating book and leave it at that, but that terse comment would not satisfy critical readers. Besides, a few observations are definitely in order.

One of the things most lacking in pharmaceutical history at the present time is the human interest side—the people side—of drug discovery. When it comes to the Pill—that is, norethindrone and related products—Djerassi fills that void well. This book contains much information about the people involved not only in the birth of the Pill but in other significant discoveries as well. However, when it comes to his own relationships with people, Djerassi was not especially successful, at least with relatives. We can be thankful that he was a much better chemist than he was a son, a husband, or a father.

University professors, including administrators, may wish to append the subtitle "The Entrepreneurial Professor" to this volume. The book emphasizes repeatedly that universities interested in recruiting and retaining truly first-rate scientists as faculty must make reasonable allowances not only for professors' association with private enterprise but also for their periodic absences from campus. Stanford has had a liberal policy in such matters, and the positive results are obvious. Speaking of travel, probably no professor has done more of it than Djerassi, so his ratings of the airlines are of interest. Aeroflot comes in dead last, just below Alitalia and Iberia. I was surprised that he did not mention the carriers in the People's Republic of China.

The chosen title, *The Pill, Pygmy Chimps, and Degas' Horse*, is only partly comprehensible without reading the book. No doubt it was the brainchild of some editor, because it is difficult to imagine Djerassi's being quite that cutesy. Reference to "The Pill" is obvious. "Pygmy Chimps" discusses a failed attempt in Africa to use these animals in fertility experiments. "Degas' Horse" details the author's successful attempt to avoid, by misdirection, paying United States customs duty on a bronze horse sculpted by Degas for which Djerassi had just paid a "nontrivial" five-digit sum in guineas at Sotheby's in London. One would think that the owner (with his children) of a 1200-acre spread in the Santa Cruz mountains—and of more stock and stock options than many Wall Streeters—would not object to paying duty on an objet d'art, but in fact, Djerassi not only details this episode but other successful smuggling (he uses that word) attempts by him and his colleagues involving both film for a movie and silk fabric. If customs inspectors read this book, I rather suspect the author may be delayed slightly on his next return to the United States.

As is sometimes the case with others engaged in various aspects of industrial pharmacy, Djerassi denigrates the professional practice of pharmacy and a system that leaves pricing up to the individual dispensing the drug. With all of the recent publicity on the high prices charged by manufacturers of drugs, such a comment seems especially inappropriate. It also causes me to wonder about the author's acceptance of an award some years ago from the Academy of Pharmaceutical Sciences, a division of the American Pharmaceutical Association.

For those interested in the responsible scientist's perspective on the effect of the Pill on social history, two chapters dealing with the scene twenty, and then forty, years after its introduction make engrossing reading. The reasons for the cessation of research on birth control methodology, urgently needed to solve the world's most pressing problem, are fascinating, albeit depressing. If you only intend to read one semipopular book this year, read this one. It will repay your effort while reminding you that our most brilliant and productive scientists are also human beings.

VARRO E. TYLER, *Purdue University*

Studies in Natural Products Chemistry, Volume 12. Stereoselective Synthesis (Part H). Edited by ATTA-UR-RAHMAN. Elsevier Science Publishers Co., PO Box 882, Madison Square Station, New York, NY 10159. 1993. xii+528 pp. 16.5×24 cm. $281.25. ISBN 0-444-893366-0.

This volume is a well produced collection of eleven chapters primarily on the synthesis of specific types of natural products. The final two chapters are exceptions, having a focus on synthetic methodology. T. Kunieda and T. Ishizuka discuss synthetic methodology for 2-amino-alcohols, and a chapter by S. Shibuya, T. Yokomatsu, and Y. Yuasa, which has the title "Stereoselective Synthesis of National Products *via* Cationic and Radical Intermediates," has acyliminuin ions and α-acylamino radicals as its principal focus. Most of the other chapters are surveys which, while emphasizing synthesis, also provide background on biological origin and activity. The subjects covered include avermectins (S.A. Peak and A.B. Smith III), use of isocyanides in β-lactam synthesis (M. Eckert and I. Ugi), 1β-methylcarbaphen intermediates (Y. Ifo and S. Terashima), taxane diterpenes (C.S. Swindell), diterpene tumor promoters (J.H. Rigby), hydroxylated indolizidines (J. Cassy and P. Vogel), and indole[2-3-a]carbazole alkaloids (G.W. Gribble and S.J. Berthel). This latter chapter gives a particularly thorough summary of the biological activity of such compounds as staurosporine. A few of the chapters are more focussed reports emphasizing the studies of the particular laboratory, such as the chapters on macrolide antibiotics (M. Nakota and K. Tatsuta) and bicyclomycin (R.M. Williams). Each of the chapters in this volume provides excellent access to the current status of work in the respective fields.

RICHARD J. SUNDBERG, *University of Virginia*

Secondary-Metabolite Biosynthesis and Metabolism. Edited by RICHARD J. PETROSKI and SUSAN P. MCCORMICK. Plenum Press, 233 Spring Street, New York, NY 10013. 1992. xi+383 pp. 16.5×25 cm. $89.50. ISBN 0-306-44309-0.

This book has been developed from the proceedings of an American Chemical Society symposium held in Atlanta, Georgia in April 1991. Speakers from this symposium, sponsored by the Division of Agricultural and Food Chemistry, subdivision of Natural Products, have provided 27 chapters which are separated into four sections. There are author and subject indices.

The "Antibiotics" section includes chapters on (1) polyketide synthetases and genetics of antibiotic biosynthesis; (2) the biosynthesis of antibiotics LL-C10037, kinamycin, and blasticidin; (3) the incorporation of partially assembled intermediates into the polyketide dehydrocurvularin; (4) the biosynthesis of streptovaricin, geldanamycin, pactamycin, validamycin, neomycin, and berninamycin; (5) enzymatic aspects of methylation in *Streptomyces*; (6) the biosynthesis of cyclohexanecarboxylic acid from shikimic acid in bacteria; (7) the biosynthesis of aristeromycin by *Streptomyces citricolor*; and (8) biosynthesis of virginiamycins M_1 and M_2 by *Streptomyces virginiae*.

The "Toxins" section contains articles on the biosynthesis of nicotine and related alkaloids by plants and aflatoxin biosynthesis in *Aspergillus*.

The section "Herbicides, Phytoalexins and Metabolic Studies" contains chapters on (1) herbicides produced by microorganisms; (2) phytoalexin biosynthesis in plant cell suspension cultures; (3) the use of fungi to study drug metabolism; (4) the interaction of alginic acid with metal ions and its relevance to biosynthesis.

The section "Isoprenoid Pathway: Biosynthesis and Metabolism" contains ten chapters, on (1) studies of metabolic turnover in plants; (2) monoterpene cyclases from plants; (3) hydroxylation of pinenes in hyssop by P450-requiring systems; (4) the use of stable isotopes to investigate the biosynthesis of cantharidin by blister beetles; (5) the metabolism of the hepatotoxin (*R*)-(+)-pulegone by rodents; (6) the biosynthesis of antibacterial sesquiterpene phytoalexins in cotton; (7) the triterpene limonoids from citrus; (8) the synthesis of natural products using the Diels-Alder reaction; (9) the production of tobacco phytoalexins; and (10) the control of carotenoid biosynthesis in plants.

The final section, "Rubber," contains chapters on (1) biosynthesis of rubber polymer; (2) cloning of rubber particle protein from guayule; and (3) the regulation of carotenoid biosynthesis by *Phycomyces blakesleeanus*. It is difficult to rationalize why the last three chapters are split from the preceding section on isoprenes, where they would fit perfectly.

Generally there is significant detail and depth; to give an indication of this, in the chapter by E. Leete there are 75 references covering a period of greater than 100 years. With the rich variety of biosynthetic topics covered, in addition to being an easy route to finding out what's new in biosynthesis, this book could, with occasional supplementary material, serve as a text for a modern course on biosynthetic aspects of natural products. This collection is recommended to all interested in natural products and especially to those interested in biosynthesis and metabolism. Libraries with natural product sections should be encouraged to purchase a copy.

CEDRIC PEARCE, *American Cyanamid Company*

An Introduction to Free Radicals. JOHN E. LEFFLER. John Wiley and Sons, 605 Third Avenue, New York, NY 10158. 1993. 287 pp. 15.5×23.5 cm. $64.95. ISBN 0-471-59406-7.

As implied by the title, *An Introduction to Free Radicals* discusses fundamental concepts in free radical chemistry from the point of view of theory, spectroscopy, structure, energetics, and reactivity. The material presented in the book would certainly provide the novice reader with a good working knowledge of free radicals. In fact, the book would serve as an ideal textbook for a one-semester course at the graduate level.

Virtually all of the fundamentals of free radicals are covered, including ESR, diradicals, radical pairs, CIDNP, CIDEP, generation of free radicals, and electron transfer. The book also discusses several specific radicals and devotes a chapter to synthetic applications. Ample references are provided at the end of each chapter for additional information and further reading.

Clearly, the coverage is not nearly as broad or thorough as in Kochi's 1973 book *Free Radicals, Volumes I and II*, which in my view still sets the standard in the field (despite the fact that it is no longer published). One might also quibble that there are several chapters which might be added to the book (i.e., a chapter on free radicals in biological systems, environmental chemistry, etc.). to make it more appealing to other disciplines. In the preface, the author outlines the object of the book: "to extract from the vast literature on free radicals a relatively modest selection of the most fundamental and generally useful material." In my view, that objective has been realized.

Overall, the author has done an excellent job in providing a comprehensive and up-to-date introduction to the fundamentals of free radical chemistry. The chapters are extremely readable, the length of the book is manageable, and the price is affordable.

JAMES M. TANKO, *Virginia Polytechnic Institute and State University*