

BOOK REVIEWS

Alkaloids. Chemical and Biological Perspectives. Volume 1, edited by S. WILLIAM PELLETIER, John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10158. 1983. v+398 pp. 23.5 x 16.0 cm. \$60.00.

This book came across my desk on a very busy day and I had no intention of reading it at the time. However, the first chapter caught my eye because it concerned the nature and definition of an alkaloid. This is a subject that has always intrigued me. If you wanted to ask a perplexing question of a Ph.D. candidate in natural product chemistry or pharmacognosy, you could always ask the candidate to define an alkaloid. So, I read the first page of the chapter and was hooked. Without intending to do so, I read the entire chapter that very morning. It was delightful reading and was written as if the author were sitting across the desk from me discussing the subject.

This book is the beginning of a series. It is intended that a new volume will be published every 12 to 24 months, and each volume will contain 350-400 pages. The editor states in the preface, "The purpose of this series is to provide comprehensive and authoritative reviews of the chemistry and biological properties of the various classes of alkaloids." The strength of the series will be that it has a broader coverage than other books of its type. It is stated in the preface, "the series will include chapters on structure elucidation, synthesis, biogenesis, pharmacology, physiology, taxonomy, spectroscopy, and X-ray crystallography of alkaloids." It is intended that the series will emphasize the biological aspects of alkaloids.

This first volume contains five chapters. Chapter One, by S. William Pellerier, Department of Chemistry, University of Georgia, provides an intriguing treatment of the nature of an alkaloid and dares to present a simple definition of an alkaloid, and in a subtle way challenges the reader to disqualify it.

Chapter Two by Tappay H. Jones and Murray S. Blum, Department of Entomology, University of Georgia, includes a discussion on the distribution, functions and chemistry of arthropod alkaloids, of which there are a wider variety than I had imagined. It appears that the functions of alkaloids in arthropods are better established than for alkaloids in plants.

Chapter Three by Edward Leete, School of Chemistry, University of Minnesota, gives, as one would expect from this author, a very complete review of the biosynthesis and metabolism of the tobacco alkaloids. This Chapter includes two very useful tables. In one table, all species (other than *Nicotiana*) are listed in which nicotine and related alkaloids have been found. The other table lists the tracer experiments, with references, relating to the biosynthesis and metabolism of the tobacco alkaloids in *Nicotiana* species.

Chapter Four presents a surprise topic entitled, "The toxicology and pharmacology of diterpenoid alkaloids." It is authored by M. H. Benn, Chemistry Department, University of Calgary, and John M. Jacyno, Department of Pharmaceutical Chemistry, Medical College of Virginia, Virginia Commonwealth University. To have a summary of the pharmacology of a class of alkaloids complete in one chapter is indeed gratifying and causes one to realize how useful it would be to have similar chapters on other classes of alkaloids. Perhaps in time this information also will be published.

Chapter Five, by M. Volhan Kisakurek and Manfred Hesse, both of the Organic Chemistry Institute of the University of Zurich, Switzerland, and Anthony J.M. Leeuwenberg, Department of Plant Taxonomy and Plant Geology, Agricultural University, Wageningen, The Netherlands, was described quite correctly in the preface as "a monumental chapter on a chemotaxonomic investigation of the plant families of Apocynaceae, Loganiaceae, and Rubiaceae by their indole alkaloid content." This is one of the most complete treatises I have ever read. In addition to including a list of synonymous alkaloid names, the chapter has nine appendices and 754 references.

Another useful feature of the book is the listing of the names of organisms in a special index rather than including them in the subject index. This arrangement enhances the usefulness of both indexes and was a commendable idea.

Because of the interdisciplinary nature of the subject matter, this book should be of interest not only to pharmacognosists and natural product chemists, but also to botanists, biologists, pharmacologists, and scientists in related fields.

This should be a popular series and will likely become established as a standard reference book for all who are interested in the chemistry and biology of natural compounds. It will also probably become assigned reading for many students in such fields. I highly recommend it.

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Aromatic Plants: Basic and Applied Aspects, Edited by N. MARGARIS, A. KOEDAM, and D. VOKOU. Martinus Nijhoff Publishers, P.O. Box 566, 2501 CN, The Hague, The Netherlands. 1982. xii + 284. 16.5 x 24 cm. Dfl. 95.00 (approx. U.S. \$41.50).

The 25 papers in this modest volume represent the proceedings of a symposium on aromatic plants held at Kallithea, Greece, in September, 1981. This collection is, in turn, volume seven of the series *World Crops: Production, Utilization, and Description*. It is the contention of its editors that this volume contains a contemporary account of aromatic plant research, especially in the areas of chemistry, pharmacology, botany, entomology and ecology.

Aromatic Plants: Basic and Applied Aspects is divided into five chapters, with the first three, "Anatomy and Morphology", "Ecology and Distribution" and "Chemotaxonomy" containing four articles each. The final two chapters, "Analysis and Composition" and "Production and Application" are constituted by seven and six papers, respectively. It is refreshing to observe that these papers are truly international in origin, since they emanate from about 25 institutions in 13 countries of five continents.

The individual articles in this book are extremely variable in length, with the longest comprising 28 camera-ready type-written pages, and the shortest only four pages. Almost all the papers have up-to-date reference sections, with only five having no references published after 1980. However, despite the attempt by the editors to cover many facets of aromatic plant research, pharmacological aspects are summarily dealt with in one paper on the spasmolytic activity of the phenols and flavonoids of *Thymus vulgaris* by van den Broucke. It seems somewhat illogical to place the paper "Chemotaxonomy of the Greek Species of *Sideritis*" in Chapter 4 ("Analysis and Composition") rather than in Chapter 3 ("Chemotaxonomy"). Surprisingly, there are no papers at all in the volume that deal specifically with the biogenesis of volatile oil constituents.

This book is written in English throughout, and is liberally illustrated, although some of the illustrations lack clarity. While a Plant Systematic Index and a Chemical Index are provided, there is no General Subject Index, which will restrict the potential use of this volume.

In summary, this book would seem to be a useful addition to natural product collections in institutional libraries. However, the book is not recommended for the individual collection, because of the non-comprehensive coverage of most of the major subject areas of aromatic plants research embraced.

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Bioorganic Chemistry. A Chemical Approach to Enzyme Action, H. DUGAS and C. PENNEY. Springer-Verlag, New York, Inc., 175 Fifth Avenue, New York, N.Y. 10010. 1981. xii + 508 pp. 16 x 24 cm. \$29.80.

This book has its origins in an undergraduate course on bioorganic chemistry, given by Professor B. Belleau at Ottawa and then McGill Universities. It is aimed at final year students in chemistry, biochemistry, biology and pharmacology, but the approach is basically chemical, and the level of chemical understanding assumed rises noticeably as the book proceeds. It has no very close competition as a teaching text at this level; in areas covered it is closest to Bruice and Benkovic's 'Bioorganic Mechanisms', published in 1966. On the other hand it does not seriously compete, in authority or scope, with Walsh's tremendous 'Enzymatic Reaction Mechanisms' (Freeman, 1979).

An introduction, which gives a handful of basic concepts a brief airing, is followed by chapters on the chemistry of amino acids, phosphates and enzymes. The discussion starts at freshman level with the structures and properties of the amino-acids, but approaches graduate student level in the treatment of selected topics, such as pseudorotation in $S_N2(P)$ reactions and the choice of protecting groups in the chemical synthesis of polynucleotides. So use as a course text would need to be carefully selective.

The real strength of the book lies in its wide ranging and up to date treatment of chemical models for biochemical reactions. This is the major emphasis, particularly in chapters 5-7, on enzyme models, metal ions, and coenzymes; and important sections deal with stereoelectronic effects, host-guest chemistry, association prefaced catalysis, the reversible binding of oxygen to synthetic porphyrins and the mechanism of action of B_{12} coenzyme. In these important and topical areas the coverage is broad (rather than critical) and a valuable entry, via the text and leading references, to the literature. The choice of examples is also refreshingly original in places, with an emphasis on the work of leading Canadian schools.

This is an attractive book, well-produced, with good, clear graphics, and briskly written. (Too briskly in places, as in the case of the frightened hormone, victim of a dangling participle, on p. 129, and the amazing synthesis of β -galactosidase on p. 249). It gives an overall impression — surely the correct one — of an area in rapid expansion, bursting with vitality. It will make a useful basis for a bioorganic course, subject to the caveat registered above. But it is also a worthwhile first-reference book at the graduate level in the area of bioorganic mechanisms. And worth reading by anyone interested in the field.

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