

## BOOK REVIEWS

*Methodicum Chemicum. A Critical Survey of Proven Methods and Their Application in Chemistry, Natural Science and Medicine.* FRIEDHELM KORTE, Editor-in-Chief. Volume 11. *Natural Compounds.* Edited by F. KORTE, Bonn University, and M. GORO, Gakushuin University. Academic Press, Inc., 111 Fifth Avenue, New York, N.Y. 10003. 1977.

*Part 1. Nucleic Acids, Proteins, and Carbohydrates* viii+231 pp. 19.5 x 27.5 cm. \$39.50.

The book is divided into four parts: Nucleic Acids, Proteins, Carbohydrates, and Lipids. Fully half of the text is dedicated to nucleic acids with the remaining half apportioned between proteins, carbohydrates and lipids. The importance of each of these subjects is manifest from the entry of articles by experts in the field, most of whom are Japanese. The natural products orientation is stressed in the text, and treatment is much more advanced than the usual textbook. As a ready reference for the graduate student or laboratory researcher, this volume of *Methodicum Chemicum* provides a handy compromise between extensive review articles and the usual elementary treatments. The book should provide resources for medical, agricultural, and pharmaceutical researchers.

As a compendium of laboratory methodology each of the sections has a practical section in which procedures of assay are detailed. The several thousand references cited also lead a researcher to the original literature.

One drawback in so comprehensive a treatise is the ability to stay up to the moment in references. The publication date is 1977, the Preface by the editors says the literature is surveyed up through 1972, and perusal of the articles finds only a few references to early 1975. At present, this book is nearly five years out of date, therefore, but still a very useful work. It would be hoped that a revised second edition could be put into print soon to update these references.

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*Part 2. Antibiotics, Vitamins, and Hormones.* ix+304 pp. 19.5 x 27.5 cm. \$49.50.

As described in its preface, ". . . *Methodicum Chemicum* is a short critical description of chemical methods applied to scientific research and practice." Volume 11 of this series "is devoted to the methods of structural determinations and syntheses of natural products; . . . biochemical functions of compounds are discussed secondarily." Generally, the book is well written and easy to read, although it does contain a surprising number of grammatical and typographical errors. Due to a delay in publication, the literature was routinely surveyed only to 1972. However, many of the 45 authors who contributed to the seven chapters of this volume, revised their sections prior to publication to include references to 1976.

The first chapter (antibiotics) includes a brief description of the history, screening and isolation, occurrence, mechanism of action, biosynthesis, clinical uses, side-effects, and pharmacokinetics of antibiotics, as well as a more extensive discussion of the structure elucidation of penicillins and oxytetracycline, and syntheses of several classes of antibiotics. The chapter provides a wealth of information but its utility is limited by the fact that only 25 references (general) are given.

Chapter two, vitamins and coenzymes, was written in 18 sections by 23 authors, with little consistency in style, format, or content. Many of the contributors to the chapter appear to be groping for a theme, apparently unaware of the purpose of the volume. Some sections are excellent, e.g., ubiquinone, plastoquinone, riboflavin, and pyridoxal, while several others describe only the biochemistry (biosynthesis, catabolism, metabolic function) of vitamins. Structures for thiamine, pantothenic acid and coenzyme A, niacin, pteroylglutamic acid, and ascorbic acid are not included. A number of errors and misleading statements also occur. To cite just two examples, there is a minor error in the structure of vitamin B<sub>12</sub>, and reference is made to the ". . . demonstration of Pauling on Vitamin C and the common cold" with no mention of the results of numerous well-conducted clinical studies which refute Pauling's contentions.

The chapter on enzymes discusses the nature of enzyme action and inhibition, enzyme classification, purification, and diagnostic applications. It should prove valuable to novices in the area.

Chapter four, hormones, was written by seven authors and again suffers from inconsistencies in content. The sections on thyroid hormones, medullary hormones, sex hormones, and phyto-hormones, while well written and interesting, are biochemical in orientation with no discussion of structure elucidation or chemical synthesis.

Three authors contributed to Chapter 5, toxic compounds, covering algal and fungal toxins (no structures are given), animal and plant toxins, and bioassay systems for potential toxins.

The absence of a section on bacterial toxins is astonishing, since diphtheria, tetanus, and botulism toxins are among the most potent poisons known to man. The section on bioassay deals exclusively with tests for mutagenicity and carcinogenicity, and contains much valuable information even though carcinogenicity was only one of the many toxic properties described earlier in the chapter. Yet two major criticisms of carcinogenicity testing were completely ignored. The ultimate tests for carcinogenicity in animals involve testing extremely high doses of the suspected carcinogen with the assumption that there is no dose-threshold for carcinogens. Recent experiments with saccharin in rodents strongly suggest that this assumption is invalid. In addition, a number of carcinogens are known to be species specific. As an example, hydroxysaffrole, the active carcinogenic metabolite of the pro-carcinogen saffrole, is produced in rodents but not in man. As a result of this species difference, saffrole is not carcinogenic in man. In fact, less than a dozen compounds have been shown to be carcinogenic in man, and the "proof" for these was obtained from epidemiological data. The failure to describe these problems in the discussion of carcinogen testing is a serious omission.

Finally, the last two chapters cover industrial fermentation and miscellany (physical chemistry of smell, taste substances, luciferins and luciferase, and chemical aspects of memory). Although these chapters are interesting and informative, they clearly do not contribute to the stated purposes of the volume, and seem strangely out of place.

This volume does succeed in bringing together a large amount of information. Although it should be valuable addition for libraries, the high price and inconsistency in content prevent the reviewer from recommending its purchase by the individual.

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*Part 3. Steroids, Terpenes, and Alkaloids.* viii+244 pp. 19.5 x 27.5 cm. \$49.50.

This book is stated to be aimed to fill the wide gap that exists between textbooks and comprehensive treatises on particular aspects of the chemistry of steroids, terpenes and alkaloids. It is written particularly for the graduate student and professional worker in the chemical, biochemical, biological, agricultural and biomedical sciences in mind.

The book consists of six chapters written by a total of 25 scientists, each an authority in his or her field, and includes the following: Chapter 1. Steroids (R. Crouch, K. Nakanishi, P. H. Solomon, 40 pp); Chapter 2. Terpenoids (S. Hayashi, T. Kato, Y. Kitahara, 43 pp); Chapter 3. Saponins (T. Kawasaki, 13 pp); Chapter 4. Alkaloids (Y. Hirata, M. Ihara, T. Kametani, 31 pp); Chapter 5. Natural Pigments (Ch. Baumann, J. W. Buchler, A. Gossauer, T. Goto, E. R. H. Jones, T. Kubota, R. A. Nicolaus, V. Thaller, R. H. Thompson, T. Tokoroyama, K. Tsukida, S. Yamamura, 72 pp); Chapter 6. Miscellaneous (A. Kawaguchi, S. Nozoe, S. Shibata, 28 pp).

Within each chapter, concise sections usually covering (a) chemical classification, (b) structure elucidation, (c) biosynthesis, (d) synthesis, (e) pharmacological properties (not always included) and tables listing the more important members of the group of compounds under discussion. Structures for most of the compounds discussed are also clearly presented.

The major deficiency in this reference work is a paucity of up-to-date literature. For example, in the chapter discussing diterpenes, only three of 142 citations were from the 1977 literature, 24 from 1976 and 25 from 1975. In the sesquiterpene chapter, 174 of 200 citations were from the pre-1970 literature.

In spite of this lack of up-to-date literature, the book is recommended for the non-specialist interested in natural products chemistry, but the cost will most likely preclude most from adding this work to their own personal library. It would be a good addition to libraries in institutions where there is an interest in natural products chemistry.

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*Biological/Biomedical Applications of Liquid Chromatography*, edited by G. L. HAWK. Associate editors, P. B. CHAMPLIN, H. C. JORDI, and D. WENK. Waters Associates, Inc., Milford Mass. Chromatographic Science Series, Volume 10, Marcel Dekker, Inc., 270 Madison Ave., New York, NY 10016. 1979. xv+736 pp. 16 x 23.5 cm. \$45.00.

This book is a collection of 36 research papers presented at the 1977 Liquid Chromatography Symposium I, "Biological/Biomedical Applications of LC" in Boston, Mass. Topics covered include chromatography of fatty acids, prostaglandins, phospholipids, glycolipids, mycolic acid, steroids, porphyrins, angiotensin, and bradykinin, while a section of seven papers

covers amino acids, peptides, polypeptides, and proteins. Nucleotides, nucleosides, neoplastic agents, and antitumor drugs are discussed in five papers, while therapeutic drug monitoring is given excellent treatment in nine papers. The drugs covered in the latter section include xanthines, theophyllines, anticonvulsant drugs, antiarrhythmic agents, methotrexate, antibiotics, catecholamine, and vitamins D<sub>2</sub> and D<sub>3</sub>. Automation of column re-generation for the determination of hemoglobin A<sub>1c</sub> is also included.

I am particularly impressed by the excellent quality of papers which appeared in the section on peptides and clinical drug monitoring. Many authors assayed using dual wavelength detection for identification and quantification of drug components and their metabolites. Methods used in analyzing drugs included paired-ion chromatography, selective ion-binding chromatography, and size exclusion chromatography in addition to normal and reverse-phase chromatography. Both pre-chromatographic and post-column chromatographic derivatization for detection of adenine, fatty acids, and phospholipids appeared in this volume.

Both the strength and weakness of this book lie in the coverage of a wide variety of seemingly unrelated subjects. Although the book has been carefully edited, the quality and depth of each individual section is uneven, as would be expected in a book of multiple authorship. The literature references cited in the papers are only up to 1976. The field of HPLC is a rapidly expanding area, and since a similar LC symposium is being held annually, a book of this type should be published within a year, if not immediately as a proceeding of such a symposium.

The book is printed by photographic reproduction of typescript and both style and format of the texts varies considerably and type sizes are uneven. However, the texts are well-produced, except for a couple of tables which are reduced too far for easy reading.

In summary, this book should be of value to research scientists engaged in clinical drug monitoring. It is not a general review but a collection of good research papers, and it should serve as a reference to separations of specific drugs for research applications and as an important source of analytical methodologies, derivatization techniques, identification of metabolites, and literature references. It would be a good stepping stone from which further advancement can be made.

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