Book Reviews

Ultramicro Elemental Analysis. By Günther Tolg, translated by Conrad E Thalmayer. John Wiley and Sons, New York, N. Y. 1970. xiii + 200 pp. 21.7 × 14.5 cm. 10.95.

This work is Volume 30 in a distinguished series of Wiley-Interscience monographs, all falling under the general heading of Chemical Analysis. Professor Tolg reviews and assembles in this book work in the literature, including his own, in what he calls ultramicro elemental analysis. The definitions are based generally on weight, whereby microanalysis refers to milligram-sized samples and ultramicro to microgram levels, perhaps 100 μg or less. The determination of such trace quantities is not discussed in terms of neutron activation analysis or mass spectrometry, but rather the more conventional techniques such as titrimetry or spectrophotometry, reduced in scale to handle such small quantities. Obviously, no one will resort to these more difficult procedures unless forced by sample size limitations. According to the author, "the necessity of developing microgram, or even nanogram, procedures appears more and more in connection with biological, biochemical, and medical problems and in the elucidation of natural substances."

Simple reagent measurement and manipulation at this ultramicro level may provide stringent tests of analytical technique, and the author first devotes a chapter to the balances, pipets, burets, and other laboratory ware required for such operations. The generous use of pictures and drawings is most useful. A subsequent chapter on sample decomposition and digest evaporation shows very specialized micro apparatus

The author then describes procedures for the determination of individual elements. Eleven different elements are discussed: C, H, N, O, S, F, Cl, Br, I, P, and As. Each element is considered in a separate section, with the exception of combining C and H. For each element a series of methods is clearly described in terms of the principle involved, required apparatus and reagents, and the procedure to follow. Elaborate and detailed drawings of apparatus are used which clarify the necessarily terse experimental description. Each method is referenced to the original literature along with other auxiliary references. The methods are also arranged according to amount or sample required (more than 5 μg, etc.)

The book is an interesting excursion into the ultramicro chemical analysis realm. The reader will come away with a greater appreciation for the exactitudes of this demanding specialty.

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Molecular Orbital Theory in Drug Research (Medicinal Chemistry, Volume 10 of a Series of Monographs). By Lemont B. Kier. Academic Press, New York and London. 1971. 258 pp. 15.2 × 23.6 cm. $15.00.

This introductory book is designed to reach students in medicinal chemistry or pharmacology, practicing scientists, and theoretical chemists unacquainted with biological phenomena. It represents a nice blend of pharmacology and quantum chemistry. The pharmacologist interested in learning elementary quantum biology as well as the theoretical chemist interested in applying his expertise to problems of biological interest should find the book a useful point of departure. The author has reached a good compromise by keeping the mathematical rigors at a minimum and by presenting the basic pharmacological principles simply and clearly. The text meets these aims well, but should not be considered a research level reference. Other reference books can be used as a foundation for the details of the principles presented here.

The 12 chapters of the book move from general considerations of drug phenomena to an introduction to quantum chemistry and molecular orbital calculations and then treat drug mechanisms from the covalent bond, charge transfer, molecular conformation, acid–base, hydrogen bonding, and dispersion force phenomena. The final chapter gives the author's suggestions for future research in this area. The organization of the material makes the text convenient for teaching purposes. It also provides a logical separation of the various phenomena and illustrates the practical utility of correlating proper electronic indices from molecular orbital calculations with appropriate biological activity data.

The author gives numerous examples, with references, of the application of molecular orbital calculations to the search for new drugs but, perhaps, could have included more fundamental references when a particular area was introduced. Although the author's own research interest is in the area of molecular conformation studies from molecular orbital calculations, extra emphasis is not given to this subject area. Rather, it is treated with due consideration to other studies such as charge transfer, etc. The author clearly and adequately points out the limitations in attempting correlations between biological activity and electronic indices from molecular orbital calculations and cautions the reader of the "dangers" of over-interpretating both the biological activity data and the electronic indices.

The text differs from existing references in that it focuses on drug research rather than detailed biochemical phenomena or quantum chemistry and should be particularly useful to students and research workers who are interested in drug design from a rational and rigorous theoretical point of view. It is recommended as a teaching text in a course at the graduate level.

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Handbook of Drug Interactions. By Gerald Swidler. Wiley-Interscience, New York, N.Y. 1971. vii + 384 pp. 16 × 23.4 cm.

Mixtures of drugs constitute the most controversial stumbling block to intelligible drug naming, to reasonable drug pricing, and to a better working agreement between the practicing physician and the pharmaceutical industry. If a mixture is presented in a fixed ratio of its components, the physician senses a willful interference with his prerogative to prescribe two or several active ingredients as he feels suitable to his patient's condition. But of course he must prescribe the multiple drugs in many therapeutic situations. He remembers the potentiation or mutual inhibition of some such drug types but rarely recalls all the occasions when the combined use of several drugs would be advantageous, disadvantageous, or perhaps useless. The new Handbook of Drug Interactions does not attempt to teach clinical pharmacology. It lists, in dictionary format, virtually all the known conditions where different types of drugs may be used together, or should not be used at the same time. These statements include a modest amount of discussion of mechanisms of drug action; this helps the reader to understand the recommendations *pro* and *contra* drug combinations. Although the original literature has been consulted, the author should have avoided using information furnished by the drug manufacturers (package inserts, advertisements, etc.) which cannot help but be biased. There is excellent cross-referencing between generic drug names and proprietary names of mixtures, and additional cross-indexing. This should be a very useful compendium for the practitioner, pharmacist, and pharmacologist.

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Chemical and Biological Aspects of Steroid Conjugation. Edited by SEYMOUR BERNSTEIN and SAMUEL SOLOMON, with 18 contributors. Springer-Verlag Inc., New York, N. Y. 1970. xii + 529 pp. 15.3 × 23.4 cm. $28.00.

According to the preface, "this book represents a collaborative endeavor by a group of investigators to bring together in a single volume a critical discussion of the major facets of our knowledge, ranging from chemical to clinical aspects, of steroid conjugation. However, the important field of bile acid and bile alcohol conjugation has been discussed only superficially since it was decided arbitrarily to be outside the projected scope of the book. The reader is referred to the companion volume of this book, namely *Physical Properties of Steroid Conjugates* (by Bernstein, Dusza, and Joseph, Springer-Verlag, New York, N. Y., 1968), for complemental information on individual conjugates." The book consists of nine chapters. It begins with a discussion of the synthesis and characterization of conjugates, including the glucuronides, sulfates, and double conjugates of various steroids. Included are discussions of the chemical synthesis, chemical properties, and physical properties of these materials. This well-written chapter by Bernstein, Dusza, and Joseph includes material from 278 references, and is followed by a chapter on the enzymological aspects of steroid conjugation by Alexander B. Roy (322 references). The hydrolysis of steroid conjugates is described by H. Leon Bradlow (105 references) and a discussion of the isolation of conjugates (105 references) by P. K. Siiteri follows. Kenneth D. Roberts and Seymour Lieberman then review the biochemistry of the 3β-hydroxy-Δ^5-steroid sulfates (240 references) and this is followed by a treatment of the formation, metabolism, and transport of estrogen conjugates by E. Diczfalusy and M. Levitz (110 references). The isolation and metabolism of conjugates of neutral steroids from natural sources are related by S. Solomon and B. R. Bhavnani and a chapter by F. Herr, C. Revesz, A. J. Manson, and J. B. Jewell covers the biological properties of estrogen sulfates (166 references). The last chapter deals with clinical aspects of steroid conjugation as described by A. M. Bongiovanni and R. M. Cohn (308 references).

The book is well printed and free from obvious errors. Although some overlap is inevitable in a work of this sort, it appears to have been held at a minimum by careful editing. A useful and complete subject index (52 pages) completes the volume. This book deals capably with an increasingly important area of steroids and belongs in every library serving those who work with any aspect of steroid conjugates.

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Fondamenti di Chimica Farmaceutica. Volume 3. By CARLO RUNTI. E. Lint, Trieste. 1970. 1112 pp. 15 × 24 cm. Lire 14,000 (approx $22).

This third and last volume consists of 10 chapters: cardiovascular drugs; gastrointestinal drugs; expectorants and mucolytic agents; dermatologicals; hematinics, electrolytes and plasma expanders; coagulants and anticoagulants; antilipemic, hypoglycemic, diagnostic, radioprotective antidotes, antialcohol and sweetening agents; vitamins; hormones; and alkaloids. As in the first 2 volumes, a wealth of structures, reaction schemes, and tables greatly enhances the clarity of the text. The bibliography is remarkably up-to-date: the section devoted to the prostaglandins, for example, includes several references of the current year, a rare finding in a textbook of this size and scope.

Professor Runti has to be congratulated upon this work, and the publishers should be encouraged to make it available in other languages. It certainly is worthy of a place in professional libraries and offices.

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The Chemistry of Indoles. By RICHARD J. SUNDBERG. Academic Press, New York, N.Y. 1970. xi + 489 pp. 16.1 × 23.5 cm. $24.50.

This excellent monograph fills the very real need that has been present in the area of synthetic indole chemistry since the publication in the early 1950's of two reviews on this subject. It covers the literature published from the early 1950's through 1967 including some 1968 and 1969 papers.

Dr. Sundberg deserves real credit, first, for his courage in undertaking this monumental task and, second, for completing it so successfully while carrying on other responsibilities.

The monograph comprises ten chapters. In the first chapter, entitled "Electrophilic Substitution Reactions on the Indole Ring," and in the second chapter, "General Reactions of Functionally Substituted Indoles," the most important reactions of the indole ring are correlated on a mechanistic basis. Chapter III describes syntheses of the indole ring, and chapter IV, synthetic elaboration of the indole ring toward indole alkanoic acids, tryptamines, tryptophans, β-carbolines and a brief treatment of indole alkaloid area. The fifth chapter deals with oxidation, degradation, and metabolism of the indole ring. The sixth chapter is entitled "Rearrangement, Ring Expansion and Ring Opening Reactions of Indoles," and Chapter VII—"Hydroxyindoles and Derivatives Including Oxindole, 3-Indolinone and Isatin." Chapter VIII deals with aminoindoles, an area which so far has received relatively little attention. Chapter IX deals with indolyl ketones, aldehydes, and carboxylic acids. The last chapter comprises a brief treatment of naturally occurring derivatives of indole and indoles of physiological and medicinal significance.

The literature is very well documented by references provided after each chapter. An author index and a good subject index are included.

This book is, of course, a must for those actively engaged in research in the indole area. Others, who are not, will undoubtedly get many ideas for future research in the indole area by perusing this monograph.

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