

## Book Reviews

**Chemical Tools in Catecholamine Research. Volume I. 6-Hydroxydopamine as a Denervation Tool in Catecholamine Research.** Edited by G. Jonsson, T. Malmfors, and C. Sachs. American Elsevier, New York, N.Y. 1975. xx + 372 pp. 16.5 × 24 cm. \$26.98. \$53.95 for the two volume set (see following book review).

This and the accompanying volume result from papers delivered at two symposia held in Goteborg, Sweden, in mid-July of 1975. This particular volume contains 42 papers from a wide range of respected investigators given in four sessions on the chemistry and pharmacology of 6-hydroxydopamine. The first section contains seven papers on approaches to determine the mode of action of 6-aminodopamine and several indole analogues, in addition to 6-hydroxydopamine. The properties of the intermediates in the oxidation of 6-hydroxydopamine to its aminochrome were emphasized, though the generation of a superoxide radical was discussed. The papers in section two cover the specific and nonspecific effects of 6-hydroxydopamine. The main question discussed is the effects on noncatecholaminergic neurons and the possibility of reversal of degeneration that occurs. The third section deals with the effects of the drug on neonatal development and overlaps with the previous section in its concern for recovery from administration. The final, and by far the largest, group of papers covers the uses of 6-hydroxydopamine in examination of catecholamine neurons. The first four papers and several others are studies of the cardiovascular system and other peripheral areas, but the majority of the work is on the CNS. Primary emphasis is on neuronal pathway studies and examination of supersensitivity, but other papers on behavior and interactions with drugs that are accumulated by catecholamine containing neurons are included.

While any book in a rapidly changing field, such as this one, is subject to the unavoidable disadvantage of becoming dated, it is unfortunate that avoidable drawbacks are present. The use of facsimile printing of papers supplied by authors has taken its toll on the quality of printing of some papers and of several of the figures. Neither this volume nor its companion contains a subject index. Medicinal chemists that are primarily interested in analogues may be disappointed at the lack of biochemical studies conducted, except in the first section; however, this symposium provides an excellent overall treatment of this rapidly changing area to those who are interested.

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**Chemical Tools in Catecholamine Research. Volume II. Regulation of Catecholamine Turnover.** Edited by O. Almgren, A. Carlsson, and J. Engel. American Elsevier, New York, N.Y. 1975. xx + 310 pp. 16.5 × 24 cm. \$26.98.

As with the first volume in this series, this volume is composed of 34 papers delivered in Goteborg by many pioneers in the area of catecholamine turnover regulation. The book itself shares many of the characteristics of Volume I. In the first section—regulation of amine levels by changes in enzyme activities—the biosynthetic enzymes are discussed at length to the exclusion of those enzymes that metabolize catecholamines, with over half of the papers on regulation of tyrosine hydroxylase. The cofactors investigated range all the way from the small, lithium and calcium ions, to a high molecular weight substance extracted from submaxillary glands of rats that inhibits aromatic L-amino acid decarboxylase. The second session contains seven papers on the effects of nerve impulse flow on neurotransmitters. While such effects are more easily studied in peripheral neurons, these papers attempt to explore the problem in the CNS, where isolation or identification of a simple neuronal pathway and proper criteria for impulse flow

are much more difficult to determine. Postjunctional and prejunctional receptors are the subject of the third session. The primary aim of the ten papers is to document the existence of post- and presynaptic receptors for feedback regulation of neurotransmitter turnover. Due to the infancy of the field, little information is given on the mechanism or, in the case of autoreceptors, the location of such receptors. Haggendal's introduction to the session is noteworthy for the clear discussion of the historical development and evidence for this new area of research. The fourth section of the conference is a panel discussion of catecholamine turnover regulation by cyclic nucleotides. While the mechanism of cAMP's trans-synaptic induction of tyrosine hydroxylase activity was discussed extensively (the reporter says "to the point of debate") other topics were included such as thyrotrophin and cycloheximide's effects on catecholamine activity and a somewhat out of place, but interesting, paper on the inhibition of pineal N-acetyltransferase activity by a fluoro analogue of histidine.

As with any book of this type, the reader's interest will be proportional to the interest he has in this area and the extent of his background. But the general high quality of the work in the papers of both volumes increases the probability that the reader will benefit from and enjoy them.

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**Annual Review of Pharmacology and Toxicology. Volume 16.** Edited by H. W. Elliott, R. George, and R. Okun. Annual Reviews, Palo Alto, Calif. 1976. 566 pp. 15 × 22 cm. \$17.00.

Those familiar with the *Annual Review of Pharmacology* will immediately notice that the title for the 16th volume has been changed to the *Annual Review of Pharmacology and Toxicology*. According to the editorial committee, the new title is due to the "increasing concern with the toxicology of nonmedical agents, the many toxicologists now in the field who were not trained primarily in classical pharmacology and the proliferation of societies and regulatory agencies devoted to toxicology". The editorial committee hopes that "the new title will help preserve the unity of the discipline".

Previous volumes of *Annual Review of Pharmacology* have contained review articles in both toxicology and pharmacology which were generally of high quality. The readers of this volume will find that the Editorial Committee has continued to perform in a commendable manner in keeping with the format of previous volumes.

The prefatory chapter of this volume is an autobiographical sketch of Chauncey D. Leake, a distinguished pharmacologist and scholar who has guided the American Society of Pharmacology and Therapeutics for many years.

A number of review articles deal directly with toxicology. The toxicology of inhalation anesthetics and metabolites (E. W. Van Stee) emphasizes the toxicity of halogenated volatile anesthetics. Of concern to environmental toxicologists are articles on arsenic toxicology and industrial exposure (S. S. Pinto and K. W. Nelson), methods for the evaluation of the toxicity of airborne chemicals (E. Goldstein, G. W. Jordan, M. R. MacKenzie, and J. W. Osebold), and morphological methods for the evaluation of pulmonary toxicity in animals (D. L. Dungworth, L. W. Schwartz, W. S. Tyler, and R. F. Phalen). Of interest to the clinical toxicologist is a review article on the treatment of poisonings by nitrite, cyanide, sulfide, barium, and quinidine (R. P. Smith and R. E. Gosselin). The detection of pulmonary toxicity from inhaled substances by using sensitive physiologic tests to evaluate abnormal lung function is discussed by A. F. Wilson, R. D. Fairshier, J. R. Gillespie and J. Hackney. The prediction of dermal toxicity including irritation, phototoxicity, and allergic contact dermatitis

is discussed in a review on cutaneous pharmacology and toxicology (H. Maibach).

Two reviews are devoted to pharmacology of hypertension. The importance of the central catecholaminergic neurons in the control of blood pressure is discussed by A. Scriabine, B. V. Clineschmidt, and C. S. Sweet, whereas the importance of the renin-angiotension system to the etiology and therapy of hypertension is reviewed by G. P. Guthrie, Jr., J. Genest, and O. Kuchel.

Of interest to the renal pharmacologist is an article on the sites and mechanisms of diuretics by H. R. Jacobson and J. P. Kokko who also outline normal renal physiology. The importance of drugs in the development of thrombosis has continued to gain attention. As a result G. Zbinden reviewed the pathogenesis of thrombosis and the evaluation of thrombogenic effects of drugs.

The effects of psychotropic drugs are reviewed in a chapter on behavioral pharmacology and toxicology (G. Bignami). Also of interest to psychopharmacologists is an excellent review of the pharmacology and toxicology of lithium (M. Schou) and an article on indoleamine toxicity (H. G. Baumgarten and A. Björklund).

A newer concept of anesthesia and its relation to drug-induced states is discussed by W. D. Winters in a review concerning the effects of anesthetics on the electrical activity of the brain.

The general scheme of the functional properties of the cholinceptive receptors of the postjunctional membrane is presented by L. G. Magazanik. The identification and role of neural transmitters or putative transmitters in invertebrates are summarized by J. Kehoe and E. Marden. P. H. Smith and D. Porte, Jr., discuss the role of the endocrine pancreas as an important neuroendocrine organ and summarize the role of neural factors in the regulation of insulin and glucagon secretion.

Gastrointestinal pharmacology is reviewed by T. F. Burks with particular emphasis on gastric secretion and myogenic control of gastrointestinal motility. The problem of bioavailability and bioequivalence of various drug products is still of timely interest and is reviewed by D. L. Azaranoff and D. H. Huffman. The development of mixed function oxidase enzymes involved in the biotransformation of drugs in the fetus and the neonate is the subject of an article by A. H. Neims, M. Warner, P. M. Loughnan, and J. V. Aranda.

Other topics discussed in this volume include the use of drugs in myopathies (D. Grob), the pharmacology of the pineal gland (K. P. Minneman and R. J. Wurtman), the use of antineoplastic drugs to suppress antibody-mediated or humoral immunity (G. H. Heppner and P. Calabresi), the structure-activity relationships of sulfonamide (T. H. Maren), effects of drugs on lipid peroxidation (G. L. Plaa and H. Witschi), the metabolism of organic nitrates (P. Needleman), and the pharmacology of drugs that effect intracellular movement (F. E. Samson).

In keeping with the international spirit of pharmacology, J. Knoll reports on the history of pharmacology in Hungary. The final article in this volume is again a review of reviews by C. D. Leake who successfully manages to keep us continually aware of the rapidly expanding field of pharmacology and toxicology.

There are 31 topics reviewed in this volume. Some of the articles cover a more narrow subject than the broad scope implied by the title. In general, most of the authors have done a good job in critically covering their subject as opposed to merely listing a bibliographic survey.

Overall, this volume has kept with the objectives of the previous volumes of the *Annual Review of Pharmacology* and is a welcomed addition to this series.

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**Clinical Use of Combinations of Antibiotics.** Edited by J. Klastersky. Wiley, New York, N.Y. 1975. 195 pp. 14 × 22 cm. \$14.00.

This book is a collection of presentations and discussions from the EORTC Symposium on Clinical Use of Combinations of Antibiotics which was held at the Institut Jules Bordet, Bruxelles, Belgium, on Jan 10 and 11, 1974.

The first two chapters review antibiotic combinations and why they are used and which of them are used in the treatment of patients who are predisposed to severe infections. The authors conclude that the use of a combination of antibiotics which is synergistic for suspected gram-negative infections could be recommended. However, following diagnosis, the combination therapy should be changed to include only an antibiotic or antibiotics to which the organism is sensitive.

In Chapter 3, antibiotic incompatibilities and interactions are discussed. This included effects of intravenous fluids on antibiotic stability, interactions between antibiotics and other therapeutic agents which may be found in intravenous infusions, and interactions between various antibiotics, e.g., penicillins and aminoglycosides.

The sequential use of antibiotics is discussed in Chapters 4 and 5, especially with reference to the organism, *Haemophilus influenzae*, and the respiratory infections it causes. The clinical results reported suggest that the addition of erythromycin after 7–24 h of exposure to ampicillin results in an enhanced bactericidal effect. However, when erythromycin was added after only 3 h of ampicillin exposure, antagonism to the bactericidal effect occurred.

The use of combinations of penicillins and cephalosporins is covered in Chapter 6. The one documented case of synergistic effect is based upon a competitive inhibition of  $\beta$ -lactamase by methicillin or cloxacillin permitting the second penicillin or cephalosporin to exert its antibacterial effect while being protected from hydrolysis.

The next group of chapters, Chapters 8–14, covers the use of combinations of antibiotics for specific clinical conditions which included (1) pneumonias due to gram-negative bacilli, (2) patients with malignant disease, (3) urinary tract infections, (4) elimination of gastrointestinal flora, and (5) the treatment of tuberculosis.

The commercially available fixed combination of the diaminopyrimidine, trimethoprim, and sulfamethoxazole is next discussed. The rationale behind this fixed combination is that both agents effect tetrahydrofolic acid but at different steps in its bacterial synthesis. The effectiveness of this combination against a variety of infections, including upper and lower respiratory tract infections and urinary tract infections, is discussed.

The synergism between cytosine arabinoside and asparaginase against both herpes simplex and vaccinia viruses is reported in Chapter 16.

The last chapter of this book is titled "Planning and Design of Multi-Institutional Trials". This is a discussion of why such trials are needed, the difficulties associated with such clinical trials, and guidelines for protocol design.

Being a collection of papers from a symposium, the papers vary drastically in the amount of information and detail supplied. In addition, since the book has no index, its usefulness as a resource book is limited. As a reference, it will probably prove more useful for clinical and hospital pharmacists than for medicinal chemists involved in the design of more effective antibiotics. However, individuals who teach courses dealing with anti-infectives will find much interesting and useful supplementary information in this book.

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**Ion-Exchange Chromatography (Benchmark Papers in Analytical Chemistry/1).** Edited by Harold F. Walton. Dowden, Hutchinson, and Ross, Stroudsburg, Pa. 1976. 440 pp. 26 × 18 cm. \$30.00.

This volume assembles a collection of 48 papers, six of which appear in their original language, accompanied by a partial translation. Since the arrangement of papers follows the historical approach, I think it a pity that the editor did not include in Part I the classical article by Tswett (1907) and that by Van Deemter on the rate theory of chromatography (1956). Paper and thin-layer chromatography are not included and all the topics revolve around column chromatography.

The introductory paper is a publication by O. Samuelson on ion exchange, followed by two papers dealing with the theory of chromatography and one specifically with ion-exchange chromatography. The remaining part of the book is concerned with the applications of ion-exchange chromatography in separations of inorganic and organic substances. Sections II-VIII deal with inorganic separations and this topic is well covered. Four sections are devoted to the ion-exchange separations of organic compounds, with special attention to the nucleic acid derivatives, amino acids, and carbohydrates. The separation of drugs and drug metabolites is briefly mentioned in the last chapter of Part XII. Overall, the section on the separations of organic compounds only hints at the tremendous versatility of ion-exchange chromatography in solving sophisticated biochemical and biomedical problems, and it does not do justice to the present day potential of the technique.

The last section includes chromatography of nonionic compounds and introduces some variants of ion-exchange chromatography such as "salting-out" chromatography and ligand exchange.

In my opinion the weakness of the book is that it does not point out clearly the tremendous capabilities of ion-exchange processes when coupled with the recent developments in HPLC. However, it should prove to be a useful reference to those interested in ion-exchange chromatography.

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**Radiopharmacy.** Edited by Manuel Tubis and Walter Wolf. Wiley-Interscience, New York, N.Y. 1976. xvi + 911 pp. 15.5 × 23 cm. \$44.50.

This volume represents a first attempt at the imposing task of integrating theoretical and practical knowledge from the numerous basic sciences and clinical specialties upon which the practice of radiopharmacy or nuclear pharmacy is based. The book contains 27 chapters written by 33 contributing authors, and aside from some repetition of historical background, the authors have shown exemplary style and judgment in the presentation of the text.

Approximately the first third of the text (Parts Two, Three, and Four) deals with radiation physics, radiation dosimetry, radiobiology, and radiochemistry. "Production and Purification of Radionuclides" by H. B. Hupf and "Synthesis of Labeled Compounds" by R. B. Bayly, E. A. Evans, J. S. Glover, and J. L. Rabinowitz are chapters that are particularly definitive. The coverage of MIRD dosimetry and the practical uses of radiochemistry in the development of radiopharmaceuticals is not adequate and many other topics are not discussed in sufficient depth.

The second general section of the book (Part Five) is concerned with the design and quality control of specific radiopharmaceuticals in both hospital and industrial institutions and their clinical applications in the diagnosis and treatment of certain disease entities. The design of a nuclear pharmacy and the role and liability of the nuclear pharmacist are explained in great detail. This section, however, does not delineate the clinical contribution of the radiopharmacist to a nuclear medicine unit in such areas as radiopharmaceutical drug interaction monitoring and scan conference participation, although responsibilities such as preparation, dispensing, record keeping, and quality control of radiopharmaceuticals are well described. The chapter on "Regulations and Legal Aspects of Radiopharmaceuticals" by E. L. Meyers and R. E. Cunningham is an excellent reference for practicing nuclear pharmacists and any investigators involved in or contemplating the use of radiolabeled compounds in biomedical research or clinical practice. The chapter entitled "Radionuclides in Pharmacology" by Y. Cohen and L. J. Roth is an outstanding presentation of this topic.

The final section (Part Six) of the text offers a broad overview of the field of nuclear medicine ranging from static and dynamic imaging procedures to the techniques associated with the development and maintenance of a functional radioimmunoassay laboratory. Numerous clinical examples are given to point out the diagnostic criteria upon which a physician must base his

interpretation of a nuclear medicine procedure.

This book provides a much needed survey of the field of radiopharmacy with emphasis on radiopharmaceuticals and the role of the radiopharmacist in their preparation and use. Its major drawback is the price, which may prevent its becoming a standard undergraduate text. By design, some of the subject matter presented, particularly that on radiation physics, instrumentation, and clinical nuclear medicine, is treated superficially. These topics are covered in depth in numerous other nuclear medical texts. The material contained in Chapter 24, "Stable Nuclides in Clinical Pharmacology", and Chapter 27, "Radionuclides in Space Biology and Space Medicine", is far removed from the daily practice of radiopharmacy and omission of these chapters from any future editions should be seriously considered.

In spite of the criticisms registered above, "Radiopharmacy" is an excellent source from which radiopharmacists and related personnel can obtain extensive information regarding the practice and value of nuclear pharmacy.

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**Spin Labeling: Theory and Application.** Edited by Lawrence J. Berliner. Academic Press, New York, N.Y. 1976. xiii + 592 pp. 16 × 23.5 cm. \$49.50.

The editor of this, the 27th addition to "Molecular Biology, An International Series of Monographs and Textbooks", has attempted to compile in one volume enough essential material to arm the reader with a comprehensive understanding of the background, theory, applications, and limitations of spin labeling. Bearing in mind the editor's intent of directing this book to a graduate level readership of wide diversity (from medicine through biochemistry and chemistry to the physical sciences) and the fact that each chapter represents an area of continuing intensive research effort, one must, with an eye to the potential hazards, stand in awe of such an undertaking. Having read this book through the eyes of an organic chemist, I think that the editor has accomplished his purpose admirably.

Following a short introduction, the theoretical basis for the use of nitroxides as spin labels is developed in three chapters. This section includes a general discussion of ESR spectroscopy, detailed treatment of molecular motion and spectral simulations, and aspects of spin-spin interactions of nitroxide biradicals. These chapters are followed by a two-chapter discussion of the chemistry and molecular structure of nitroxide spin labels. Included are experimental details for synthesizing a large number of nitroxides, several of which have not been published or are being presented in revised form. A short chapter on instrumental aspects follows with a discussion of the physical operation of an ESR spectrometer and the use of computers to process spin-labeling data. The remaining chapters are devoted to the two principal areas of biomedical research utilizing spin labels: enzymes and lipids and membranes. In one chapter the various reagents and laboratory techniques for spin-labeling enzymes are discussed and in another the theoretical and experimental background for spin-label-induced nuclear magnetic resonance relaxation studies of enzymes is developed. Coverage of lipid and membrane systems includes the use of spin labeling in liquid crystals as model systems, in artificial lipid bilayers, and in biological membranes.

It should be noted that these chapters are not reviews of the literature nor are they intended as such, rather they are written from a pedagogical point of view. A reader interested only in a specific area of this subject will find the pertinent chapter to be an excellent introduction to that topic, while the book as a whole constitutes a logical and orderly development of the entire subject of spin labeling.

The book is largely free from typographical errors (this reviewer found only three) and is very well referenced. However, the use of Roman numerals in place of the more commonly employed Arabic numerals to designate individual compounds hinders at times locating the discussion of compounds containing as many as eight numerals, i.e., LXXXVIII. Unfortunately, many potential readers, including most graduate students, will probably consider

the price of this book prohibitive.

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**Aliphatic Chemistry. Volume 4 (Specialist Periodical Reports).** By A. McKillop, Senior Reporter. The Chemical Society, Burlington House, London. 1976. x + 281 pp. 13.5 × 21.5 cm. £18.00.

This volume reviews the literature published during 1974. Chapter 1, "Acetylenes, Alkanes, Allenes and Olefins", is further subdivided according to topics relevant to each class of compounds. Chapter 2 contains sections on 13 common functionalities, other than those above, plus a "Miscellaneous" section and one on "Reviews".

The two shorter chapters which follow may be of particular interest to medicinal chemists. Chapter 3, entitled "Naturally Occurring Polyolefinic and Polyacetylenic Compounds", includes sections on polyacetylenes, allenes, acetylenes and olefins from marine sources, polyolefinic microbial metabolites, cyclopentenones, degraded and/or modified isoprenoids, polyolefinic insect pheromones, and miscellaneous polyolefins. Chapter 4, "Chemistry of the Prostaglandins", contains sections on nomenclature, syntheses, prostaglandins in coral, metabolism, and biosynthesis.

In the absence of a subject index, there is a detailed table of contents and an author index. One can only postulate on the fact that for 1974 there were 1324 references deemed worthy of inclusion in this volume, which is about 500 fewer than for the previous year. Correspondingly, there are only two-thirds as many pages in this volume as in its predecessor but at a price which is one-third higher. Nevertheless, this book is still a valuable aid to researchers dealing with aliphatic compounds who wish to augment their normal reading coverage.

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**Recent Advances in Phytochemistry. Volume 9.** Edited by V. C. Puneckles. Plenum Press, New York, N.Y. 1975. ix + 309 pp. 14 × 23 cm. \$27.50.

This volume consists of 11 papers dealing with various aspects of the topic, "Phytochemistry as Related to Disease and Medicine", which were presented at the Fourteenth Annual Meeting of the Phytochemical Society of North America held in August 1974 at Western Carolina University. Topics which are covered include hallucinogenically used plants (R. E. Schultes), chemistry and metabolism of the cannabinoids (M. E. Wall), carcinogenicity of marijuana smoke (D. Hoffman, K. D. Bruneman, G. D. Gori, and E. L. Wynder), crop plant chemistry and folk medicine (J. A. Duke), contact allergy from plants (J. C. Mitchell), teratogenic constituents of potatoes (J. Kuc), plant neurotoxins (C. Ressler), chemistry of tumor-inhibitory natural products (S. M. Kupchan), laboratory models for the biogenesis of indole alkaloids (A. I. Scott), antimicrobial agents from higher plants (L. A. Mitscher), and structure of the insect antifeedant azadirachtin (K. Nakanishi).

While the chapters by Schulte, Duke, and Mitchell are not chemically oriented, they are well written and should be a useful source of information. Of particular interest is the chapter on the chemistry and metabolism of cannabinoids, which summarizes various methods for the synthesis of cannabinoids and their metabolites as well as a discussion of the metabolism of cannabinoids. The chapter on antimicrobial agents from plants is a welcomed addition and should be of great value to those working in this voluminous, scattered coverage of this topic in the literature. The chapter on the biogenesis of indole alkaloids by I. A. Scott is excellent. The author discusses the biosynthesis of strychnine, biogenetic-type synthesis of the indole alkaloids, evolution of a

regio- and stereospecific model, and stereochemical and structural relationships within alkaloid families. Speculations on the relevance of these studies for chemotaxonomy and for the enzymology of alkaloid biosynthesis are also presented. The remaining chapters are well documented, informative, and up-to-date.

The general impression of the book, apart from the uneven quality inevitable in symposium-type publications, reflects the general activity in phytochemical research and should provide a useful reference for those working in natural products.

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**Carbohydrate Chemistry. Volume 8 (Specialist Periodical Reports).** J. S. Brimacombe, Senior Reporter. The Chemical Society, Burlington House, London. 1976. xii + 485 pp. 13.5 × 21.5 cm. \$66.00.

This report reviews the 1974 literature in carbohydrate chemistry. The arrangement of subject matter is identical with previous volumes, greatly benefiting the reader. Although there is no subject index, the table of contents is thorough and well organized, and an author index is included.

The report is divided into two parts, the first dealing with mono-, di-, and trisaccharides and their derivatives and the second with macromolecular carbohydrates. Part I, which cites 970 references, reviews the chemistry and methods of structure determination, analysis, and separation of a wide variety of sugar derivatives. Part II reviews the analysis, fractionation, and chemical characterization of polysaccharides, glycoproteins, and glycolipids, the synthesis and chemical modification of complex carbohydrates, and the isolation and specificity of enzymes utilizing carbohydrates as substrates. In all, 2090 references are cited in Part II.

This series continues to be valuable reading for those attempting to keep abreast of the literature in the carbohydrate field.

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**Immunity and Cancer in Man. An Introduction.** Edited by A. E. Reif. Marcel Dekker, New York, N.Y. 1975. xix + 156 pp. 15 × 23 cm. \$12.50.

The immune response to a cancer cell includes a host of cellular and noncellular interactions that vary with the type and stage of tumor development. This book describes some of the most significant of these interactions. The book contains chapters by experts that range from the basic sciences to clinical management.

Initial chapters describe the varied antigenicity of tumor cells with specific emphasis on the host's immune reactivity toward these antigens. The absolute complexity and lack of predictability of the immune response is stressed. The advantages of stimulating killer T-cells, and unblocking antibody, and of suppressing blocking and humoral responses are clearly introduced for more complete discussion in later chapters.

Current clinical approaches regarding the use of nonspecific T-cell stimulators, like BCG, are also discussed with particular reference to the importance of timing of their administration in relation to tumor size and stage. Also and perhaps more importantly specific reasons for their potential failure are discussed.

The role of the surgeon and radiologist in the management of the cancer patient is also described; however, their treatment is limited in that only successful immunotherapy can kill that last cancer cell.

The final chapter describes the potential role of diagnostic cellular morphology in the immune response to neoplasia. A clear understanding of the lymphoid cell type, i.e., killer T-cell, B-cell, or macrophage, within or surrounding a tumor mass would most certainly be a major achievement in the diagnosis, management, and prognosis of the cancer patient.

Overall, this edition presents a viewpoint on cancer immunity that should not be overlooked by interested students, clinicians, and researchers.

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**Terpenoids and Steroids. Volume 6 (Specialist Periodical Reports).** By K. H. Overton, Senior Reporter. The Chemical Society, Burlington House, London. 1976. x + 363 pp. 13.5 × 21.5 cm. £20.50.

This volume continues the outstanding work of previous volumes in the series. The literature between Sept 1974 and August 1975 is covered, with the same organizational pattern as previously being employed. Among terpenoids, a fascinating variety of new structural types has been uncovered; when these compounds are crystalline, x-ray methods rapidly lead to the structures, but even for amorphous compounds, new spectroscopic methods and techniques, together with interpretive ingenuity, are shown in structure determination. Much ingenious total synthetic work has been reported for both terpenoid and steroid compounds; the steroid skeleton continues to be the framework for an apparently inexhaustible variety of interesting compounds and reactions. The terpenoid and steroid subdivisions of the book are formally unified by the chapter on biosynthesis, which like the others is of excellent quality. The book continues to be indispensable to workers in the field of natural products and is enthusiastically recommended to those unfamiliar with the series.

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**Progress in Medicinal Chemistry. Volume 12.** Edited by G. P. Ellis and G. B. West. North-Holland Publishing Co., Amsterdam and Oxford; American Elsevier, New York, N.Y. 1975. x + 484 pp. 21 × 14.5 cm. \$58.50.

Volume 12 of this well-established series contains eight reviews, of which six concentrate on the applications of physical, chemical, and enzymological techniques to biological problems. These techniques have had continually widening application in medicinal chemistry, and these six reviews are written for readers with a biological background to enable them to assess the potential of this valuable technique in their own work. The review summarizes recent progress in these fields and should be of value to medicinal chemists for this reason, as well as to others who plan to utilize these methods.

The chapters in question are "Gas Liquid Chromatography-Mass Spectrometry in Biochemistry, Pharmacology and Toxicology", by A. M. Lawson and G. H. Draffan; "Recent Advances in Column Chromatography", by K. W. Williams and R. C. Smith; "NMR Spectroscopy in Biological Sciences", by P. J. Sadler; "Electron Spin Resonance in Medicinal Chemistry", by D. L. Williams-Smith and S. J. Wyard; "Polarography in Biochemistry, Pharmacology and Toxicology", by M. Brezina and J. Volke; and "Methods Related to Cyclic AMP and Adenylate Cyclase", by B. G. Benfy.

The remaining two reviews, "Resistance of *Pseudomonas aeruginosa* to Antimicrobial Drugs", by R. B. Sykes and A. Morris; and "Functional Modifications and Nuclear Analogs of Beta-lactam Antibiotics-part I", by J. Cs. Jaszberenyi and T. E. Gunda, are concerned with chemotherapy of pathogenic bacteria. The last chapter is the first of two parts and concerns penicillin and cephalosporin antibiotics which have recently been synthesized. This chapter winds up with a brief section on structure-activity relationships in the  $\beta$ -lactam antibiotics which reviews some of the structural parameters and their relationship to biological activity. This section is suggestive of some needed new synthetic compounds. Part 2 of this review is scheduled to appear in Volume 13 of this series.

This series continues to present valuable reviews for the specialist in the field of medicinal chemistry. The first six chapters of this volume would be particularly useful for advanced students of medicinal chemistry desiring a review of the application of physical-chemical methods to the field.

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**The Enzymes. Volume XII. Third Edition.** Edited by Paul D. Boyer. Academic Press, New York, N.Y. 1975. B/C 1227-12 2368. \$41.00.

This book is an update of developments in the field of enzymatic oxidation-reduction reactions. Part B is devoted to three main topics: Electron Transfer (II), Oxygenases, and Oxidases (I). The book is divided into eight chapters dealing with (1) Iron-Sulfur Proteins, pp 1-56; (2) Flavodoxins and Electron-Transferring Flavoproteins, pp 57-118; (3) Oxygenases: Dioxygenases, pp 119-189; (4) Flavin and Pteridine Monooxygenases, pp 191-252; (5) Iron- and Copper-Containing Monooxygenases, pp 253-297; (6) Molybdenum Iron-Sulfur Flavin Hydroxylases and Related Enzymes, pp 299-419; (7) Flavoprotein Oxidases, pp 421-505; (8) Copper-Containing Oxidases and Superoxide Dismutase, pp 507-579. The literature is covered up to 1974.

This book has all the advantages and disadvantages of a collective volume written by several authors. The obvious advantage is that every chapter is written by an investigator(s) actively involved in the development of the particular field. On the other hand, there is a considerable amount of repetitiveness arising from the lack of communication between the authors. The personal interests of the contributors are reflected in the differences in emphasis given to the topics in the chapters. While several authors review their topics in depth and cover broad segments of theoretical and experimental information, others devote most of their attention to physicochemical procedures.

Also, several authors reused portions of their material published in 1974 in another book. This seems to be unavoidable as long as authors commit themselves to contribute chapters to several books on similar topics at essentially the same time.

In general, however, this is a useful book which will be of help to students and investigators involved in the studies of enzymatic oxidation reactions.

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