decomposed with water (50 mL), extracted with ether (3×25 mL) washed with water, dried (Na_2SO_4), and concentrated to give an oil, which on crystallization with benzene–hexane gave a compound identical in all respects with **5** (0.3 g, 54.8%).

***C*-Nor-9,11-secoestrone 3-(Methyl ether) (6).** A solution of **3** (0.30 g, 0.001 mol) in anhydrous dichloromethane (5 mL) was added in one portion to a stirred solution of pyridinium chlorochromate (0.50 g, 0.002 mol) in dry CH_2Cl_2 (5 mL). Stirring was continued at room temperature for 1 h. The dark reaction mixture was diluted with anhydrous ether (20 mL). The supernatant was decanted off from the dark gum. The insoluble residue was washed thoroughly with anhydrous ether (3 × 10 mL), when it became a granular solid. The combined organic solution was passed through a short column of Florisil, and the solvent was removed to give **6**, which was crystallized from hexane, yield 0.275 g (92.3%): mp 64–65 °C; IR (KBr) 1720 (17-C=O), 1600, 1580 (aromatic) cm^{-1}; ^1H NMR (CCl_4) δ 0.87 (s, 3 H, 18-CH_3), 1.10 (s, 3 H, 12-CH_3), 2.45 (m, 2 H, C-9 protons), 2.68 (m, 2 H, C-6 protons), 3.67 (s, 3 H, 3-OCH_3), 6.32–6.88 (m, 3 H, Ar *H*); mass spectrum (M^+), *m/e* 272; $[\alpha]^{28}_D$ +151°. Anal. C, H.

17α-Ethynyl-*C*-nor-9,11-secoestradiol (7). To a stirred solution of lithium acetylide–ethylenediamine complex prepared from lithium (0.27 g, 0.038 g-atom) and dry ethylenediamine (75 mL) was added a solution of **5** (0.3 g, 0.0011 mol) in dry THF (25 mL), and the mixture was further stirred for 2 h. Dry acetylene was passed into the mixture throughout the reaction. NH_4Cl was added to decompose excess of lithium, and the mixture was diluted with water and extracted with ether. The ether layer was washed with water, dried over Na_2SO_4, concentrated to give an oil, and filtered through short silica gel column with use of increasing amounts of benzene in hexane as eluant to give **7**: 0.2 g (58%); mp 93–95 °C; IR (KBr) 3400 (3- and 17-OH), 1600, 1580 (aromatic) cm^{-1}; ^1H NMR ($CDCl_3$) δ 0.9 (s, 3 H, CH_3), 1.3 (s, 3 H, 12-CH_3), 2.5 (s, 1 H, CH≡C*H*), 6.45–7.0 (m, 3 H, Ar *H*); mass spectrum, *m/e* (M^+) 284; $[\alpha]^{28}_D$ +14°. Anal. C, H.

17α-Ethynyl-*C*-nor-9,11-secoestradiol 3-(Methyl ether) (8). To a stirred solution of lithium acetylide–ethylenediamine complex prepared from lithium (0.25 g, 0.37 g-atom) and dry ethylenediamine (75 mL) was a solution of **6** (0.5 g, 0.0018 mol) in dry THF (30 mL), and the mixture was further stirred for 2 h. Dry acetylene was passed into the reaction mixture throughout the reaction time. The excess of lithium was decomposed with solid NH_4Cl, and the mixture was diluted with water and extracted with ether. The ether layer was washed with water, dried over Na_2SO_4, and concentrated to give an oil, which was crystallized with benzene–hexane to give **8**: 0.35 g (60.3%); mp 103 °C; IR (KBr) 3400 (OH), 1600, 1580 (aromatic) cm^{-1}; ^1H NMR ($CDCl_3$) δ 0.93 (s, 3 H, 18-CH_3), 1.23 (s, 3 H, 12-CH_3), 2.58 (s, 1 H, C≡C*H*), 3.76 (s, 3 H, OCH_3), 6.6–6.7 (m, 2 H, 2-C*H* and 4-C*H*), 6.92–7.02 (d, 1 H, 1-C*H*, J = 8 Hz); mass spectrum, *m/e* (M^+) 298; $[\alpha]^{28}_D$ +5.5°. Anal. C, H.

Biochemical and Biological Methods. Receptor Affinity. The relative binding affinity (RBA) of the compounds for uterine cytosol estrogen receptors, obtained from immature Sprague–Dawley rats, 21–25 days old, were determined by a competitive inhibition assay, employing dextran-coated charcoal (DCC) for separation of unbound steroids as reported earlier.[17]

Uterotrophic Activity. The uterotrophic activity of the compounds was evaluated in ovariectomized immature rats (25–30 g) as assayed by uterine weight gain. The compounds were administered subcutaneously once daily, over a 3-day period, in 0.5 mL of saline–propylene glycol (1:1, v/v). Autopsy was performed 24 h after the last administration. The uteri were carefully dissected, blotted to release intraluminal fluid, and then weighed. Control animals received the vehicle only for similar period. The dose–response curves were constructed and relative uterotrophic activity (estradiol as 100%) at double uterine weight were computed.

Antiuterotrophic Activity. The antiuterotrophic activity of the compounds were assayed in immature rats (25–30 g). The compounds were administered subcutaneously in 0.5 mL of propylene glycol–saline (1:1, v/v) along with 0.1 mg of E_2-17β (in 0.2 mL of olive oil) at two different sites for 3 consecutive days. Inhibition is expressed as percent inhibition from the formula of Hartman et al.[18]

Antiimplantation Activity. This was studied in sperm-positive female albino rats mated to coeval males of proven fertility. The compounds were given subcutaneously (sc) in 0.5 mL of propylene glycol–saline (1:1, v/v) or were administered orally (po) as a suspension in gum acacia to colony-bred adult female rats (150–170 g) on days 1–7 postcoitum, with five to seven animals in each group. The animals were examined by laparotomy on day 10 of pregnancy for the number of implants. The minimum dose of compounds in which implants were totally absent in both the uterine horns were recored.[16]

Registry No. 1, 84371-12-0; **2**, 113507-89-4; **3**, 113507-90-7; **4**, 113507-91-8; **5**, 113507-92-9; **6**, 113507-93-0; **7**, 113507-94-1; **8**, 113507-95-2.

(17) Salman, M.; Ray S.; Agarwal, A. K.; Durani, S.; Setty, B. S.; Kamboj, V. P.; Anand, N. *J. Med. Chem.* **1983**, *26*, 592.
(18) Hartman, R. W.; Kranzfelder, G.; Angerer, E. V.; Schonenberger, H. *J. Med. Chem.* **1980**, *23*, 841.

Book Reviews

Drugs and the Body. Robert M. Julien. W. H. Freeman, New York. 1988. xvi + 297 pp. 15 × 23 cm. ISBN 0-7167-1842-1. $12.95.

This book presents a minipharmacology and miniphysiology text for graduate students or premedical college seniors who want to acquire an overview of materia medica and its biological and clinical applications. It is written in a clear and understandable manner but is much too technical for a liberal-arts-oriented person. Nevertheless, it will fill a gap between professional texts and popular home-medicine compendia.

All types of diseases, their symptoms and treatment, and hundreds of drugs with their advantages, disadvantages, and dosage regimes and general reading references are listed. Notably absent are chapters on pain and, even more so, on psychopharmacological agents; imipramine is presented as a drug to prevent bed wetting, not as an antidepressant. There are five appendices: cough and cold mixtures; antibiotics (antibiotics are poorly defined on pp 189–190) and their specific uses; anticancer drugs (here one misses retro-pathways and any mention of AIDS); and a long list of poison control centers all over the country.

There are many grievous errors in structural formulas: malathion (p 27); scopolamine (p 29); furosemide (p 102); allopurinol (p 108); aldosterone (p 134); ascorbic acid (p 176). These should be corrected immediately. Cardiac glycosides are called alkaloids (p 61), uracil is called pyrimidine nucleus (p 219), and there are spelling mistakes (p 104, l. 5; p 17, l. 2–3), etc. These errors occur so frequently that they annoy an attentive reader.

The book is printed nicely and inexpensively. It will be useful (after a correcting revision) for non-medical students, health professionals, and even general practitioners.

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Headache Research. Edited by F. Clifford Rose. John Libbey, London. 1987. viii + 280 pp. 17 × 24 cm. ISBN 0-86196-0971. $49.00.

This book *Current problems in NEUROLOGY: 4* is based on the 6th International Migraine Symposium that was held in London in October 1986. Following a chapter directed toward definition of the criteria for the diagnosis of migraine headache, the book is divided into five main sections "Migraine pathogenesis", "Vascular aspects", "Migraine therapy", "Cluster headache", and "Chronic headache". The first section consists of 10 monographs which generally address the pathogenesis of migraine, although several, e.g., the relationship of migraine and depression and the EEG mapping studies, seem misplaced. The second section is comprised of five monographs addressing various cerebrovascular aspects of migraine. Perhaps the third section (11 monographs), which deals with therapies for the treatment of migraine, will be of principal interest to medicinal chemists, although even this is largely clinical and chemical structures are notably absent. The last two sections (15 monographs) are largely clinical, immunological, and pharmacological and, with the exception of the last two chapters, i.e., those on eperisone in muscle contraction headache and antidepressants (MAO inhibitors and tricyclics) in certain headache patients, would seem of only marginal interest to most medicinal chemists.

In summary, this very specialized book will likely be of interest to a very specialized group deeply involved in migraine research.

Staff

Organic Electronic Spectral Data. Volume XXIII. 1981. Edited by John P. Phillips, Dallas Bates, Henry Feuer, and B. S. Thyagarajan. Wiley-Interscience, New York. 1987. xiii + 1051 pp. 16 × 23 cm. ISBN 0-471-63557-x. $120.00.

This series was initiated in 1956 in an effort to abstract and publish, in formula order, all ultraviolet–visible spectra of organic compounds. After the first two volumes, covering the literature from 1946 to 1955, were produced, one volume was published every other year until 1965. Since 1966 the book has been published annually. The present volume references ultraviolet–visible spectral data published in most journals containing such data in 1981.

This volume is the 23rd in the series that now includes data on more than half a million spectra. It will be especially appreciated by analytical chemistry libraries that include the earlier volumes.

Staff

Review of Organic Functional Groups. Introduction to Medicinal Organic Chemistry. Second Edition. By Thomas L. Lemke. Lea & Fibiger, Philadelphia. 1988. x + 142 pp. 15 × 23 cm. ISBN 0-8121-1128-1. $12.00.

This book presents an introduction to medicinal organic chemistry for students of pharmacy, chemistry, and allied health fields. Its objectives are to enable the reader to draw a chemical structure given the common or IUPAC name and to predict aqueous, acidic, or basic solubilities of compounds, as well as to estimate chemical stabilities under various storage conditions and the potential metabolism of each organic functional group.

After a basic introduction to factors determining water solubility and chemical binding various chemical classes, e.g., alkanes, alkenes, aromatic hydrocarbons, halogenated hydrocarbons, alcohols, phenols, ethers, carbonyl compounds (aldehydes, ketones, esters, amides, etc.), sulfonic acids, sulfonamides, and heterocycles, are described from the standpoint of nomenclature, physical–chemical properties, and metabolism. The book is concluded with a brief chapter on "Predicting Water Solubility" plus appendices on "Stereoisomerism—Asymmetric Molecules" and "Acidity and Basicity" and a thorough index.

This clearly written book is intended for beginning scientific students, particularly in pharmacy, nursing, and allied health fields, and it achieves these objectives in a remarkably easily comprehended manner.

Staff

Inflammatory Bowel Disease. Edited by Gunnar Järnerot. Raven, New York. 1987. x + 182 pp. 16 × 24 cm. ISBN 0-88167-318-8. $55.00.

The *Tenth International Berzilius Symposium*, which took place in Örebro, Sweden, during October 1986 dealt with inflammatory bowel disease (IBD) and is summarized in this book consisting of 19 presentations by 33 contributors. IBDs, the central feature of which is chronic, unexplained inflammation of the gastrointestinal tract, are of two possible types, namely ulcerative colitis and Crohn's disease. The etiology of these diseases is not known. In the case of Crohn's disease reliable activity indices have been developed, but there are no definitive criteria for the diagnosis of ulcerative colitis. During recent years, knowledge of the epidemiology and etiologic factors in IBDs has increased. These factors are discussed; however, much information is still a matter for dispute. Among the topics relating to IBD that are discussed in this book are genetic influences, the possibility of a causative infectious agent, immunological approaches to diagnosis, the relationship between smoking, contraceptive drugs, and factors precipitating relapse of the disease. The possibility that ulcerative colitis could be related to colonic mucin production, as well as the role of eicosanoids, aluminum, and dietary factors, is also considered.

A small part of the book is devoted to new medical treatments, for example, with immunosuppressants. A chapter dealing with 5-aminosalicyclic acid based drugs and one concerned with future medical treatment will be of main interest to medicinal chemists. The volume, however, will primarily be of interest to those actively researching in this area, as well as to clinicians caring for patients with ulcerative colitis or Crohn's disease.

Staff

Controlled Drug Delivery. Fundamentals and Applications. Second Edition, Revised and Expanded. Edited by Joseph R. Robinson and Vincent H. L. Lee. Marcel Dekker, New York. 1987. xix + 716 pp. 16 × 23 cm. ISBN 0-8247-7588-0. $125.00.

This is Volume 29 in *Drugs and the Pharmaceutical Sciences*, "A Series of Textbooks and Monographs". By "controlled drug delivery" is meant the administration of drugs so that the optimal amount reaches the target site to cure or control the condition in an optimum fashion. To achieve this, increasingly sophisticated means for sustaining drug delivery have been developed. Polymers, with differing degrees of erodibility, swellability, and sensitivity to a particular biological environment have taken on a particularly prominent role in various routes of administration of therapeutic agents. To effectively exploit polymers in drug delivery it is imperative to understand their basic physical, chemical, and biological properties.

Liposomes, earlier thought to be the solution to optimization of drug delivery, have since proved most effective for diseases affecting the reticuloendothelial system and to blood cells in systemic circulation, to which these carriers are confined. These disappointments have led to the pursuit of alternative carriers, such as insulin, monoclonal antibodies, and glycoproteins. Clearly, controlled drug delivery is being directed more intensely toward molecular biology. Recent research interest in peptides has focused attention on routes of drug administration that avoid the gastrointestinal tract. At the same time research is being directed toward means for enabling oral administration of peptides.

These various complexities have led the editors to divide this edition into three major parts. Part I addresses the fundamentals of controlled drug delivery; it deals with routes of drug administration, the basics of mass transfer and polymer science, utilization of polymers, pharmacokinetics, pharmacodynamics, bioavailability assessment, and dosing considerations. Part II is concerned with the design and implementation of technology-based controlled release drug delivery systems, e.g., oral, parenteral, implantable, and transdermal systems. Lastly, Part III is directed toward biochemical and molecular biological approaches to controlled drug delivery, i.e., microparticulate, selective endocytosis, and antibodies as drug carriers. Overall, there is very limited overlap between the first edition and this one.

Undoubtedly, controlled drug delivery is becoming increasingly important in the utilization of new drugs and the optimization

of older ones. This general topic, which is capably addressed in the present edition, is an absolute must for those in the pharmaceutical industry who want their products to succeed in an optimal fashion. It is imperative reading for formulation research pharmacists. Controlled drug delivery requires meticulous scrutiny before any new drug product is marketed.

Staff

Vaccines 87. Modern Approaches to New Vaccines: Prevention of AIDS, and Other Viral, Bacterial, and Parasitic Diseases. Edited by Robert N. Chanock, Richard A. Lerner, Fred Brown, and Harold Ginsberg. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York. 1987. xxii + 461 pp. 17 × 24 cm. ISBN 0-87969-302-9. $95.00.

This book presents a summary of the 1986 annual meeting on Modern Approaches to Vaccines held at the Cold Spring Harbor Laboratory. The book is divided into five sections, namely, "Immunology", which focuses on antigens, antibodies and immunopotentiation, and parasites, "AIDS" (molecular biology, immunology and pathogenesis, epidemiology and animal models, and vaccines or therapy for AIDS and other retrovirus diseases), "Pathogenic Bacteria and Viral Glycoproteins", "Pathogenesis and Attenuation", and "Recombinant Vectors and Paroviruses". Lastly, there is presented a short summary of modern approaches to new vaccines and an appendix "World Health Organization Programme for Vaccine Development" as well as a listing of the authors and titles of poster presentations. A brief, but sufficient, index is also included.

Although the general pattern of the program, which has proved of considerable popular interest, was similar to that of previous years, discussion of AIDS, whose shadow continues to spread over the world, was allotted extra time, especially as some believe that modern approaches to vaccination can present some answers. The book is clearly directed toward immunologists, genetic engineers, and those generally concerned with vaccines. At present medicinal chemists will likely be most interested in the promising dideoxynucleotides, e.g., azido-3-deoxythymidine and dideoxycytidine, as chemotherapeutic agents. Even though the development of only partially successful drugs, particularly for the treatment of AIDS, is still limited, it is hoped that new approaches based on the structural characteristics of viral proteins may offer future directions for medicinal chemists. Thus, although *Vaccines 87* does not appear of immediate great concern to medicinal chemists, it points to significant future directions. It is clearly of importance to those concerned with state-of-the-art approaches to new vaccines and deserves a place in all medical libraries.

Staff

Advances in Chromatography (Volume 26). Edited by J. Calvin Giddings, Eli Grushka, and Physllis R. Brown. Marcel Dekker, New York. 1987. xviii + 402 pp. 15 × 23 cm. ISBN 0-8247-7664-X. $83.50.

This is the 26th volume in the *Advances in Chromatography* book series (not the meeting papers series of "Advances" by A. Zlatis) that has been issued since 1965. The eight sections in this volume cover a broad range of narrow topics: three sections on gas chromatography (GC) and five on liquid chromatography (LC). The reviews in this volume do an excellent job of assembling eight experts that accomplish the Advances Series goal of presenting critical, current reviews to help chromatographers "stay abreast of advances" and to "separate the hard-core advances from the flood of supporting evidence and data".

The LC chapters cover a diverse range of topics. In Chapter 1, H. J. Möcke beautifully reviews the reversed-phase LC (RPLC) of sulfur/carbon compounds. Much data (often his own) relate retention to structure or eluent composition through graphs and enthalpy tabulations. This leads the author to some interesting speculation on the type of bonding that sulfur compounds make with solvents and supports.

Chapter 8, by E. Gelpí, covers LC applications of neurotransmitters (biogenic amines) and their metabolites. For such a well-studied field, Dr. Gelpi does a good job of putting order into the 150 references in his bibliography (through 1986), mostly by the extensive use of clever tables. Tables of isocratic separations typically are categorized by type of chromatography (e.g. ion exchange, reversed-phase, high-speed LC, multidimensional LC, etc.) with a detailed description of columns and eluents, for the five biogenic amines: catacholamines (adrenaline, noradrenaline, and dopamine), serotonin, and internal standard (α-methyldopamine). Titles might have more clearly stressed *differences* in the five main tables. Other tables list conditions for gradient runs (vs isocratic, above); references used with different detectors (electrochemical, dual electrode electrochemical, fluorescence, etc.) and some high-speed analyses on 3-μm columns (although the "speed" of the runs is not given).

Chapter 3 on high-performance hydrophobic interaction chromatography (HIC) of proteins might have added "on Toya Soda products" since much of the fine work is by Y. Kato using Toya Soda products, but the principles extend to other products. It does require some considerable rooting to determine that the "gel" part of "TSK gel" is indeed a silica-based and not polymer-based support. Many good tables systematically summarized the effects of salts and organic solvents on retention and recovery.

Chapter 4 by I. Watson on LC for therapeutic drug monitoring (TDM) and determination of toxicity is attacking a huge topic, and the author covers nine major catagories of drugs (e.g. immunosuppressives, anticonvulsants, antimicrobials, antineoplastics, etc.). The great breath of the topic might have forced the author to give only a starting place for further literature review (although nearly 600 references are included). The sections on drug screening and "determination of toxicity" might have been left for a separate review.

The last of the three chapters on LC techniques, Chapter 7, is by R. M. Smith on retention indices (RI) in reversed-phase LC. This very good chapter puts the alkan-2-one RI standards, developed extensively by Dr. Smith, into perspective with other RI standards, developed extensively by Dr. Smith, into perspective with other RI systems in LC. Perhaps not well stressed by the author is the usefulness of the chapter for selecting model compounds for more fundamental studies, e.g. to estimate retentions for compounds that show only hydrophobic interaction, only hydrogen bonding, etc. The author well illustrates the use of RI standards in LC for peak identification, structure–activity relationships, and characterizing stationary phase/eluent combinations. Unusual tables compare different RI systems and stress how much C-18 columns differ from different sources (and show how very different is a styrene–divinylbenzene reversed-phase support).

Three chapters cover GC techniques. Chapter 6, next to the that on LC retention index systems, by L. Blomberg, addresses the use of RI systems with capillary GC columns (vs packed GC columns) and the greater difficulty in obtaining reproducibility. After reviewing the various RI systems for GC, the author gives a good overview in capillary GC of the use of RIs to predicting molecular structures, "graph theory" for predicting indices, and influence of various parameters on indices (e.g. temperature, gas flow rate, etc.).

Chapter 2, a discipline a bit remote from the average researcher, is the use of "fleuric" devices in GC instrumention by R. Annino. A better recognized title might have used "fluidic ammplifiers" vs "fleuric". This chapter is fascinating in that so many electronic functions can be performed by fluids, a technology that is the bais of a process control gas chromatograph that Dr. Annino helped develop.

A. H. Mohamad and J. A. Caruseo summarize clever work with element-selective (e.g. carbon, chlorine, oxygen, and sulfur) plasma emission detectors for GC. Tables compare element detection limits, selectivity, linearity, and detector type for different types of excitation sources (e.g. inductively coupled and direct coupled plasmas). The reader might have a better understanding of why this clever method is so infrequently used if there had been more discussion of the limitations of the method, available commercial instrumentation, costs, and how the method fits in with other element selective detector techniques (e.g. mass spectroscopy).

In conclusion, one might criticize the Advances Series for its diverse topics, ranging from theory, methodology, and applications over the fields of GC, LC, and TLC. The books might have been better arranged for the more specialized buyer, possibly with

alternating volumes being split between LC and GC (e.g. Vol. 25 concerned only LC). Volumes in the last several years concern predominantly LC topics.

The layout of the books is very readable, with uniform type and few errors. The strict requirement for the outlines at the beginning of each chapter are a decided plus to the series, keeping authors systematic and permitting readers to target issues of interest.

The Advances Series is an excellent place to begin any review of a new field, both for background information and for finding names of leading experts. The Advances authors and referenced authors will guide the reader's more methodical literature search.

The editors have done a fine job of gathering experts in a wide variety of fields to bring us the background, to identify experts, and to outline the state-of-the-art in eight narrow topics up to their publication date. All scientists using separations should be familiar with this powerful reference series. The "Contents of Other Volumes" with chapter titles and authors in the front of each volume of the Advances Series is an exceptional resource for beginning the study of a new field.

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AIDS—Acquired Immune Deficiency Syndrome—and Other Manifestations of HIV Infection. Edited by Gary P. Wormser, Rosalyn Stahl, and Edward Bottone. Noyes Publications, Park Ridge, NJ. 1987. xiii + 1103 pp. 16 × 24 cm. ISBN 0-8155-1108-6. $98.

This book on AIDS is written in a style that can be read and appreciated both by health care workers and scientists actively working in the field and by those interested in knowing more about the disease. It is apparent that the editors carefully arranged the 54 chapters into a series of very readable and logically sequenced articles rather than packaging separate and highly technical papers. The chapters progress from the history of the disease to current ways of dealing with it and to future prospects.

Overall the work deals with seven areas including, in order, background and epidemiology; etiologic agents; immunology of HIV infection; clinical manifestations; pathology of HIV infection; infection control considerations; and treatment and prevention of HIV infection. Each section is well organized and provides both basic introductory material and advanced topic discussion. Certain areas such as the nature of retrovirus cell infection and the immunobiology of AIDS are covered in great detail. A potential cure for this disease by adoptive therapy, drug therapy, and/or biological therapy is presented with the view that a treatment protocol which includes multiple therapies may offer the best chance for success.

After reading the book, one's appreciation for each patient's feelings of hopelessness is pointedly confirmed as the limits of medicine and society's general unwillingness to accept the seriousness of this disease are appropriately stated.

This book should serve as a required reference for those wishing a clear understanding of the current state of this complicated disease.

I recommend this book highly and suggest that it is well worth the investment.

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Coenzymes and Cofactors. Volume I. Vitamin B_6. Pyridoxal Phosphate. Chemical, Biological and Medical Aspects. Edited by David Dolphin, Rozanne Poulson, and Olga Avramović. Wiley, New York. 1986. Part A. xiv + 725 pp. 16 × 24 cm. ISBN 0-471-09785-3. $99.95. Part B. xiv + 792 pp. 16 × 24 cm. ISBN 0-471-09783-7. $99.95.

These two books constitute Volume I of a treatise on coenzymes that the editors say "provides, for the first time, coverage on all major aspects of cofactor structure and function". The two parts of Volume I contain a total of 37 chapters written by 53 contributers from nine countries. The coverage is broad and the volumes represent a useful addition to the literature on a vitamin which, in it coenzyme forms, functions in over 60 enzymes. Part A includes chapters on the chemistry of the coenzymes and on methods of investigation. Part B is dedicated to enzymology, nutritional, and medical topics. Although the volumes suffer somewhat from overlapping coverage, most contributions are of good to excellent quality. There are literature citations through 1983–1984 and author and subject indices.

A historical introduction by Esmond Snell opens part A. This is followed by chapters on the chemistry (John Likos and Ganesh Kishore), conformation and stereochemistry (Monica Palcic and Heinz Floss), and model reactions (Daniel Leussing). In Chapter 3 Palcic and Floss discuss both nonenzymatic and enzymatic studies. An interesting generalization is that most pyridoxal phosphate dependent enzymes use a single basic group to catalyze sequential proton-transfer steps with internal proton recycling. The fact that the base is usually located on the *si* face of C-4′ of the pyridoxal phosphate suggests a common evolutionary origin for all of the enzymes. This conclusion should be considered together with existing knowledge of three-dimensional structures of the aspartate aminotransferases discussed in part B.

Chapters 5–10 deal with methods of investigation that have been applied to both coenzymes and enzymes. These include studies of kinetics and equilibria (W. Terry Jenkins), absorption spectra, quantum chemical calculations, and luminescence (Yurii Morozov), mass spectrometry (George Tryfiates and R. R. Smith), ^{31}P NMR spectroscopy (Klaus Schnackerz), X-ray studies on small molecules (Monique Darriet, Marie Basurko, Andre Cassaigne, and Jacques Darriet), and use of spin labels (Vladimir Timofeev and Alexander Misharin). In Chapter 11 Walter Korynyk describes synthesis and properties of vitamin B_6 analogues and in Chapter 12 Harold Klosterman describes the synthesis and properties of naturally occurring vitamin B_6 antagonists.

The biosynthesis of vitamin B_6 is considered by Robert Hill and Ian Spenser in Chapter 13. The final six chapters of part A deal largely with analytical methods: isolation of pyridoxal phosphate and its derivatives (Yoshimasa Morino and Fujio Nagashima), chromatography (Stephen Coburn), fluorescence (Jorge Churchich), use of a chromogenic substrate (Clarence Suelter and James Dombrowski), immunochemistry and immunoassays (Jason Kittler and John Thanassi), and radiometric and microbiological assay (Tomas Guilarte).

Part B begins with an introductory chapter on the binding sites for pyridoxal phosphate in enzymes by Marino Martinez-Carrion. Bob Yang describes methods for resolution of enzymes and for reconstitution of active enzymes from the apo forms. Christopher Walsh provides a succinct summary of information on "suicide substrates" and Marat Karpeisky and Henry B. F. Dixon review the increasingly popular use of pyridoxal phosphate as a reagent for the modification of proteins.

The next eight chapters describe specific groups of enzymes. Chapter 5, by Costantino Salerno, Anna Giartosio, and Paolo Fasella, describes transaminases. This, together with a chapter on aspartate aminotransferases by Yurii Torchinsky, nicely complement the recent treatise "Transaminases" (Wiley, 1985). Racemases are discussed by Kenji Soda, Hidehiko Tanaka, and Katsuyuki Tanizawa, enzymes catalyzing elimination and replacement of β substituents in amino acids by Edith Miles, and those catalyzing γ elimination or replacement by Jorge Churchich. Bella Sukhareva discusses decarboxylases. The glycogen phosphorylases are considered by Neil Madsen and Stephen Withers. The role of the coenzyme in these proteins is still uncertain, but it is clear from X-ray crystallographic studies that the phosphate groups of pyridoxal phosphate and of the substrate glucose 1-phosphate are seated adjacent one to another. The last enzyme considered, 4-keto-6-deoxy-D-glucose-3-dehydrogenase, which requires pyridoxamine phosphate, is reviewed by Pedro Gonzalez-Porqué.

Chapters by George Tryfiates and Manuchair Ebadi describe the metabolism of vitamin B_6 and its coenzyme forms. The final four chapters deal with nutritional and medical topics. Elizabeth Donald discusses human nutritional needs. John Sturman describes the role of vitamin B_6 in the metabolism of sulfur amino acids and inborn errors in this metabolism. Ernest McCoy also discusses metabolism in humans and therapeutic uses of vitamin

B_6. In the final chapter Alec Lui and Lawrence Lumeng describe pharmacologic and therapeutic usage of vitamin B_6. Hereditary defects of the enzymes glutamate decarboxylase, ornithine aminotransferase, cystathionine β-synthase, γ-cystathionase, and δ-aminolevulinate synthase are known in human beings and usually have serious consequences. Therapy with pyridoxine is sometimes beneficial. A series of other conditions may be indirectly affected by vitamin B_6.

Although this treatise is as current as could be expected readers will do well to also consult the 1987 symposium volume "Biochemistry of Vitamin B_6" (T. Korpela and P. Christen, Eds., Birkhäuser, Basel). The cloning and sequencing of genes as well as new X-ray studies promise to lead to rapid advances in this field.

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Topics in Lipid Research. By R. A. Klein and B. Schmitz. The Royal Society of Chemistry, Burlington House, London. 1986. xii + 331 pp. 15 × 22 cm. ISBN 0-85186-353-1. $65.00.

This book represents the Proceedings of the 3rd International Conference on Lipid Chemistry organized by the Lipid Chemistry Group of the Perkin Division of The Royal Society of Chemistry. The conference was held in Cambridge, England in April of 1986. The overall theme of the conference concerned "inter-relationships between structure and function for lipid molecules and their macromolecular ordered systems". Those presentations covered by the book are divided into six sections, namely: (1) Platelet Activating Factor, (2) Eicosanoids, (3) Glycolipids, (4) Of Probes and Anaesthetics, (5) Membrane Structure and Function, (6) Environmental Adaptation.

Medicinal chemists and pharmacologists will no doubt find the papers covered in the first two sections to be of greatest interest. On the other hand, both these topics have been extensively reviewed over the past few years (even by many of the same authors) so that purchase of the book would not be justified on this basis alone. The section on Glycolipids covers such topics as glycolipids of the leprosy bacillus, mycobacterial lipids and their antigens, and enzymology of glycosphingolipids. The importance of glycolipids in immunology and a variety of metabolic disorders should attract readers to this section. The section on anesthesia is presented as a round table discussion involving eleven of the participants and includes a provocative review of the subject by Dr. Bangham, in whose name the book is dedicated. Others on the panel stress the caution needed in the interpretation of results in which synthetic membrane probes such as spin-labeled and fluorescent lipid analogues are employed. Investigators conducting studies with biomembranes will find this section instructive, and it represents a good prelude to the following section on Membrane Structure and Function. In addition to basic biochemical studies, this section includes discussions on phospholipid membranes and on the reconstitution of membrane proteins into lipid vesicles, topics highly relevant to current pharmaceutical interest in drug delivery systems. The final section on Environmental Adaptation provides some fascinating insights on how various organisms have adapted to their environment by altering their membrane architecture. Rather than fatty acid esters typical of triglycerides and phospholipids, lipids resistant to saponification such as glyceryl diethers and macrocyclic ethers become manifest. Overall this book represents an up-to-date overview of the topics discussed. Although lipid biochemists will be the group most interested in purchasing the book for their personal libraries, certainly medicinal chemists, biochemical pharmacologists, and pharmaceutical scientists will find certain sections both readable and valuable.

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