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Book Reviews

Investigation of Rates and Mechanisms of Reactions. Third Edition. Part I. General Considerations and Reactions at Conventional Rates. Edited by E. S. Lewis. (Volume VI in the series, "Techniques of Chemistry". Edited by A. Weissberger.) Wiley, New York, N.Y. 1974. xiii + 838 pp. 22.5 × 15 cm. \$42.50.

This volume is the successor to Part I of Volume VIII of the highly respected Weissberger series, "Technique of Organic Chemistry". This new series has combined the former with "Technique of Inorganic Chemistry" in recognition of the artificiality inherent in division of methodology by subfields. It is the stated aim of the Editor to avoid thorough reviews of applications of the various techniques but rather to concentrate on a few illustrative examples. There is also the expressed desire to make individual chapters more readable and concise. In the opinion of this reviewer, the Editor has succeeded admirably in reaching these aims.

The coverage within the 14 chapters ranges from detailed discussions of experimental techniques to considerations of abstruse theoretical ideas. Since 17 contributing authors are involved, considerable variation in the nature of the coverage of each topic must be expected. Some chapters are all too brief; others are quite comprehensive. Almost all share a uniformly high quality, which was the trademark of the original Weissberger Series.

Chapter I, "General Methods of Rate and Mechanism Study" (E. S. Lewis) consists of introductory material, much of which is at the level of a good undergraduate organic text.

Chapter II, "Activated-Complex Theory: Current Status, Extensions, and Applications" (R. A. Marcus) develops the underlying theory.

Chapter III, "Homogeneous Gas-Phase Reactions" (A. Maccoll) describes apparatus, including both static and flow systems, detection methods, analysis of results, and assignments of mechanism. This thorough treatment is complemented by numerous examples and tabulations.

Chapter IV, "Kinetics in Solution" (J. F. Bunnett) repeats some introductory material en route to the development of various rate equations. There follow a cursory coverage of the requisite apparatus, a brief review of available techniques, a discussion of precision and errors, and an extensive discussion of the pitfalls awaiting the unwary.

Chapter V, "Kinetic Isotope Effects" (W. H. Saunders, Jr.) discusses the theory of both primary and secondary isotope effects, illustrated with a number of examples for both deuterium and tritium, delves into solvent isotope effects, and concludes with a consideration of heavier elements.

Chapter VI, "Tracer Methods" (V. F. Raaen) briefly considers analytical applications followed by a discussion of several examples of applications to mechanistic studies of rearrangements and ion-pair return. There follows some practical information dealing with purchase and preparation of labeled compounds, including a brief survey of more commonly used nucleides, both stable and radioactive.

Chapter VII, "Stereochemistry and Reaction Mechanism" (R. V. Stevens, W. E. Billups, and B. Jacobson) considers nucleophilic and electrophilic ionic aliphatic substitution, olefin-forming elimination, and electrophilic addition to double bonds and concludes with a lengthy discussion of various reactions subject to orbital symmetry control.

Chapter VIII, "From Kinetic Data to Reaction Mechanism" (J. F. Bunnett) covers the effects of medium, temperature, pressure, and acidity on reaction rates and discusses some of the principles and criteria for determination of reaction mechanisms.

Chapter IX, "Kinetics of Complex Reactions" (R. M. Noyes) discusses consecutive and competitive processes, illustrated with a number of representative examples.

Chapter X, "Homogeneous Inorganic Reactions" (J. H. Espen-

son) deals with applications peculiar to inorganic and organometallic processes.

Chapter XI, "Homogeneous-Solution Catalysis by Small Molecules and by Enzymes" (M. F. Dunn and S. A. Bernhard) covers catalyst complexes and kinetics pertaining thereto, enzyme kinetics, transients, and intermediates and discusses examples of catalytic mechanisms in protic solvents.

Chapter XII, "Mechanism in Heterogeneous Catalysis" (M. Boudart and R. L. Burwell, Jr.) considers kinetics of heterogeneous catalytic reactions, isotopic tracers, poisoning, applications of stereochemical data and of infrared absorption spectroscopy, spectroscopy of catalysts during reactions, adsorption studies, and correlations among catalytic properties, activity, and selectivity.

Chapter XIII, "Use of Computers" (K. B. Wiberg) considers data processing and data collection for simple and also for complex reactions. Several sample programs are included.

Chapter XIV, "Linear-Free Energy Relations" (R. Fuchs and E. S. Lewis) examines the nature and basis of linear free-energy relations in general and of the Hammett equation in particular, as well as their failure. Experimental planning and data treatment are also discussed.

One of the most delightful pieces of scientific writing which this reviewer has seen may be found in Chapter VIII. The discussion of the determination of reaction mechanisms, including suitable references to Sherlock Holmes, should be required reading for all undergraduate and graduate students, as well as all practicing chemists who may ever be tempted to assign a mechanism to a reaction.

Only a few items appear on the negative side. There is a dearth of cross references between chapters, which results in some duplication, particularly of introductory material, although such duplication allows each chapter to stand by itself. In Chapter VII the terminology for reaction classification (e.g., E1cB) is not well defined and the consequences of radical intermediacy upon stereochemistry are not discussed. Instead, an excessively long section of this chapter is devoted to "Orbital Symmetry and Electrocyclic Reactions (it should be "Pericyclic") in a manner which is too obscure for the novice but oversimplified for the specialist. Better coverages of this topic are available. A potentially more serious problem is the fact that three references, sought out by this reviewer in other chapters, were found to be in error or missing.

Most chapters include a large number of references, and there are some as recent as 1974. This constitutes a tribute, to both editor and publisher, for the production of a multi-author volume without delay. As befits the topics covered, there are many older references. Each chapter includes a separate, detailed table of contents and there is a general index. In addition to providing the necessary background for mechanistic investigation, this book is also an excellent reference source. It is highly recommended, not only for libraries but for all chemists to whom determination or interpretation of reaction mechanisms is of interest. Considering current book prices, its cost is reasonable.

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Synthetic Fibrinolytic Thrombolytic Agents. Chemical, Biochemical, Pharmacological, and Clinical Aspects. Edited by K. N. von Kaula and J. F. Davidson. Charles C Thomas, Springfield, Ill. 1975. 489 pp. 25 × 16.5 cm. \$34.50.

Mortality from thrombotic vascular disorders is nearly three times that caused by cancer. Treatment with anticoagulants and thrombolytic enzymes may be useful but is severely limited. Anti-

coagulants reduce the extent of vascular obstruction but cannot dissolve existing thrombi. Enzymes are antigenic, expensive, and may cause hemorrhage. In search of new treatments the First International Symposium on Synthetic Fibrinolytic Thrombolytic Agents was held in Paris in September 1972. Thirty-two papers were presented plus two panel discussions, one on desirable properties of an antithrombotic agent and the second on pharmacological fibrinolysis induction.

A thrombus consists of platelet masses surrounded by polymorphonuclear leucocytes and fibrin strands. It was generally agreed that the ideal agent should prevent platelet and leukocyte aggregation as well as promote fibrinolysis.

Much attention was naturally given to plasmin, a proteolytic enzyme from blood capable of catalyzing the hydrolytic conversion of insoluble fibrin into soluble fragments. Plasminogen, an inactive precursor, is converted to plasmin by activators found in tissue. Chemical fibrinolytic agents may act by stimulating the conversion of plasminogen to plasmin by causing release of activators or by blocking the action of activator inhibitors. The test systems used are complex and poorly understood.

Structure-activity relationships are at a primitive level. The structures of two active compounds often mentioned, flufenamic acid and *o*-thymotic acid, were not given. Structures of nine active compounds are given on p 62 but they are not named nor is it clear what they have in common other than that they are acidic.

This volume is a worthy attempt to focus attention on an important but poorly understood area of pharmacology. Much space is devoted to clinical evaluation of agents such as phenformin and many others. None emerged as approaching the ideal compound.

The second international congress on this topic was held in Paris during the fall of 1974 and will be published by Raven Press, New York, N.Y. A third congress is planned for Glasgow in 1976.

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Analytical Profiles of Drug Substances. Volume 4. Edited by Klaus Florey. Academic Press, New York, N.Y. March 1975. xi + 526 pp. 15.5 × 23.5 cm. \$26.50.

This volume follows the format of the previous three in the series, providing ready reference to data on the physical and chemical properties of 20 compendial drugs. These include cefazolin, cephalixin, chloramphenicol, chlorazepate dipotassium, cloxacillin sodium, diatrizoic acid, disulfiram, estradiol valerate, hydroxyprogesterone caproate, isosorbide dinitrate, methaqualone, norethindrone, norgestrel, phenformin hydrochloride, procainamide hydrochloride, reserpine, spironolactone, testosterone enanthate, theophylline, and tybamate. Addenda, errata, and a cumulative index to Volumes 1-4 are appended.

Fully aware of the advantages of photoreproduction of typed copy, this reviewer would suggest to the editors and/or contributors that typing of manuscript be done on machines that allow for the use of proper superscripts which do not impinge onto the lines above. The article on reserpine is poor in this respect. Failing this, references should be put in parentheses as, e.g., in the article on cloxacillin. Paging through the book uncovers a few typographical errors and omissions: p 159, Solvent System IV; p 401, line 8; reproduction of the spectra on pp 340 and 341 is poor; p 439 (USP Ia melting range); p 471, line 5; p 479, paragraph 4, line 10, etc.

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Handbook of Drug and Chemical Stimulation of the Brain. Behavioral, Pharmacological and Physiological Aspects. By R. D. Myers. Van Nostrand-Reinhold, New York, N.Y. 1974. xvi + 759 pp. 16 × 23.5 cm. \$37.50.

The purpose "... in writing this book has been to present a comprehensive and up-to-date survey of the world's literature that

pertains to the direct action of a drug or other chemical on the brain."; so writes the author, Professor R. D. Myers, who has made many contributions to this field of research. The book, which consists of 13 chapters, is more than just a compendium of early and current literature dealing with the effect on CNS function of chemicals injected directly into the brain. Not only does the author convincingly present his views supporting direct "chemical stimulation" of the CNS as a viable and rational approach to the understanding of the intricate organization of CNS and its functions, but throughout the text the author provides thoughtful and critical appraisal of much of the literature.

This is best illustrated in the first two chapters in which the author discusses the rationale, methodology, and necessary precautions which must be exercised in the application of chemicals directly to the CNS. In addition, these two chapters contain a wealth of practical information, such as the optimal size and configuration of cannulas and electrodes and the relationship between injected volume and diffusion within brain, etc., which ordinarily is difficult, if not at times impossible, to cull from the literature. By organizing the massive amount of pertinent literature around major physiological and behavioral systems such as cardiovascular, respiratory, and other vital functions (chapter 3), adrenal, thyroid, and other hormonal systems (chapter 4), reproductive functions and sexual behavior (chapter 5), temperature regulation (chapter 6), hunger and feeding (chapter 7), thirst and drinking (chapter 8), sleep and arousal (chapter 9), sensory and motor systems (chapter 10), emotional behavior (chapter 11), and learning and behavior (chapter 12), the author has facilitated access to this literature and the reader interested in any one of the above systems can become cognizant of contributions made by scientists from various disciplines. Throughout the text of these ten chapters the physiological and/or behavioral response of the animal to the direct application of chemicals to the CNS is related to the interaction of these chemicals with well-recognized neuronal systems or pathways and with endogenous neurohumors. Moreover, in short sections entitled "Concluding Remarks" the author summarizes and evaluates the most pertinent observations and thus provides the reader with an encapsulated and comprehensive view of the massive amount of detail that is contained within each chapter. Throughout the text the author rightfully decries those studies in which little or no attention has been paid to strict anatomical localization of the injected material, to the volume or concentration of the injectate, the state of the animal, or appropriate neuropharmacological controls. The Master Summary Tables which follow the "Concluding Remarks" provide an alphabetically arranged list of all chemicals used in studies referred to in each of the chapters. These tables also include dosage, volume, site of injection, species used, state, response, and the name of authors and year of reference. The book ends with an interesting, if provocative chapter entitled "Epilogue" which is an admixture of the present state of the art and the author's attempt to extricate from the morass of detail presented in the preceding 12 chapters a basic understanding of the neuroanatomical and neurochemical organization underlying CNS function.

Minor discrepancies can be found in the text; for example, in the last chapter the author suggests that termination of serotonin action depends primarily on extracellular degeneration by monoamine oxidase, while that of norepinephrine depends primarily on reuptake. Not only is monoamine oxidase an intracellular enzyme, but most evidence indicates that inactivation of both these agents is mediated primarily through reuptake mechanisms. In my opinion, the inclusion of a chapter or a section on the synthesis and metabolism of neurotransmitters would have been helpful; nevertheless, this book should be of interest to all scientists working in neurobiology.

In summary, Professor Myers has provided us with a comprehensive, detailed, and easily accessible account of studies on the physiological and behavioral effects of direct application of drugs and chemicals to the CNS. The text is highly readable and profusely and clearly illustrated with figures and tables which contain to a large extent original data (a definite plus). It can be recommended without any reservations to students as well as junior and senior scientists interested or actively working in the neurosciences.

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Methodicum Chemicum. Volume 1. Analytical Methods. Parts 1A and 1B. Edited by Friedhelm Korte. Academic Press, New York, N.Y. 1974. Part 1A, x + 628 pp, 18.5 × 27 cm. Part 1B, x + 590 pp, 18.5 × 27 cm. \$98.00.

This is the first of an ambitious series of 11 volumes intended to provide concise critical description of chemical methods for chemists and other scientists working in areas such as medicine. Volume 1 comprises two books: Part 1A, *Purification, Wet Processes, Determination of Structure*, has eight sections: "Foundations for the Critical Discussion of Analytical Methods", "Methods of Separation", "Determination of Classes of Compounds and Functional Groups by Chemical Methods", "Importance of Chemical Transformations for Analytical Purposes", "Spectroscopic and Photo-metric Methods", "Fragmentation Methods", "Diffraction Methods", and "Equilibrium and Kinetic Methods". Part 1B, *Micro-methods, Biological Methods, Quality Control, Automatization*, has six section headings: "Special Physical Methods", "Trace Analysis of Elements in Organic Materials", "Methods for the Determination of Essential Organic Components", "Carbohydrates, Proteins, Nucleic Acids", "Biochemical and Biological Methods", and "Developmental Trends in Analytical Methods". The 103 authors and coauthors of the 88 chapters were recruited from Austria, Canada, England, Germany, Israel, Japan, Switzerland, and the United States.

The volume provides encyclopedic coverage of analytical chemistry literature through 1971. It provides chapters that are problem oriented and chapters that are hardware oriented. Inevitably, the analytical methods which have blossomed since the chapters were conceived, such as high-pressure liquid chromatography and immunoassay techniques, are not covered. Even so, the books provide descriptions of instrumental techniques of which this reviewer was only dimly aware or entirely ignorant. One such chapter, in Part 1A, titled "Elektronenbrenzen", describes the electron pyrolysis of low concentrations of organic compounds in tritiated water, the stable tritiated fragments being used for characterization. This accompanies chapters on mass spectrometry, field ionization and special mass spectroscopic methods, and pyrolysis of polymers. Part 1A also includes chapters on spectroscopy in its various forms, chiro-optical methods, X-ray, neutron, and electron diffraction, methods using electron microscopy, and determination of absolute configuration. There are 12 chapters on separation methods and 9 on functional group analysis. The section on "Equilibrium and Kinetic Methods" includes chapters on polarography and voltammetry, organic applications of ion-resonance spectroscopy, and determination of tautomeric equilibria. Heinrich Kaiser provided an interesting but somewhat abstruse essay on the philosophical basis of analytical operations. Günter Giesselmann's title, "Importance of Chemical Transformations for Analytical Purposes", implied an essay on "the analysis of things as they are not" but delivered a review of silylation in gas chromatography.

Part 1B provides 8 chapters on special physical methods, 7 chapters on trace analysis, and 7 chapters on "Methods for the Determination of Essential Organic Components". This last is an unfortunate title, for "essential" is used neither in its connotations of volatile oils chemistry nor nutrition. The topics covered are pesticides, pharmaceuticals, food additives and contaminants, organic compounds in water and waste water, petrochemicals, fats, oils, and waxes, and industrial gases. The chapter on pesticides, written by H. V. Morley and K. A. McCully of Canada, is outstanding in the volume in its lucid definition of the problems and their solutions. G. F. Phillips' chapter on the analysis of pharmaceuticals is written from the standpoint of the forensic chemist. Ira Rosenbloom and Frederick Coulston of Albany provided an interesting chapter on pharmacological and toxicological determination of drug activity. Evan McChesney and Coulston provided a chapter on biological transformations of drugs, which is unique in its first-hand description of the development of drug metabolism studies.

Essay reviews by J. T. Clerc on "Applications of Combinations of Instrumental Methods" and by W. Simon and Clerc on "Trends in Instrumental Analysis", in the last section of the volume, might profitably be read in conjunction with Kaiser's chapter, mentioned above. D. G. Porter and R. Sawyer provided a lucid chapter on automation of analytical methods, with comparisons of available laboratory mechanization equipment and a look forward to computerized data reduction (a process now in hand in many analytical laboratories). The very last chapter, by Günther Tölg, is titled, "Trends in Ultramicro (Submicro) Elemental Analysis".

Both books provide the Table of Contents for the volume; however, the 53-page index follows Part 1B. Each chapter has extensive references to the primary literature and a bibliography. All of

the chapters are authoritative and concise. The language and orthography are American English, although English is not the primary language of most of the contributors. Typographical errors appear to be few and of little consequence. The books are beautifully printed and bound as befits their price. Overall, this volume provides a panoramic view of the many diverse fields of which modern analytical chemistry is composed. Its editorial staff deserves congratulations for a triumph of organization.

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Progress in Medicinal Chemistry. Volume 11. Edited by G. P. Ellis and G. B. West. North-Holland Publishing Company, Amsterdam and Oxford; American Elsevier, New York, N.Y. 1975. x + 277 pp. 21 × 14.5 cm. \$32.95.

A diversity of subjects is covered in Volume 11 of "Progress in Medicinal Chemistry". The chapters are "Stereochemical Aspects of Parasympathomimetics and their Antagonists: Recent Developments" by A. F. Casy; "Quantum Chemistry in Drug Research" by W. G. Richards and M. E. Black; "Psychotomimetics of the Convolvulaceae" by R. A. Heacock; "Antihyperlipidaemic Agents" by E.-C. Witte; and "The Medicinal Chemistry of Lithium" by E. Bailey et al.

The latter three chapters are largely written in a descriptive style and will be primarily of value to those with particular interests in the subjects. In the main, to this reviewer, they seem thorough, and the chapter by R. A. Heacock on the convolvulaceae makes enjoyable reading as well.

The Richards and Black chapter on quantum chemistry is very well done. The authors evaluate critically the uses and limitations of quantum chemical methods to drug research concisely (in 23 pp) and in a clear, easily understood style. This reviewer has read no better balanced, nontechnical perspective on the subject.

Probably the most important and demanding chapter in the book is A. F. Casy's on the parasympathomimetics. The author is an experienced researcher and reviewer in this field. The theme of the chapter is an important one since it concerns what can be inferred concerning a receptor by studies of the properties and activities of a neurotransmitter (acetylcholine) and its analogs. The conformation of acetylcholine has been studied by X-ray, NMR, and by quantum chemical methods. Is the active conformer that which predominates in solution? Are there different modes of binding of acetylcholine which distinguish nicotinic and muscarinic actions? Do agonists and antagonists occupy the same binding site? One of the chief approaches of the medicinal chemist in approaching these questions is to design and study the properties of fixed conformational analogs to probe the nature of the hypothetical drug receptor(s). Difficulties of interpretation arise from imperfections of the molecular approximations and can be especially troublesome if the pharmacological response may be the result of several molecular events, e.g., neurotransmitter release or uptake in addition to effects initiated at the receptor. Nonetheless, much progress has been made, and this chapter repays careful attention by the reader.

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The Practice of NMR Spectroscopy. By Nugent F. Chamberlin. Plenum Press, New York, N.Y. 1974. xxiv + 421 pp. 28 × 22 cm. \$29.50.

The book can be divided into two major parts, a series of six chapters (115 pp) and a collection of NMR charts (solid bars) which comprise the major portion of the book (215 pp). Heavy emphasis is placed upon application rather than theoretical aspects of proton NMR. Chapters 1 and 2 introduce elementary NMR terminology and experimental procedures followed in producing NMR data.

The misleading title of Chapter 3, "Analytical Procedures", is subdivided into three major areas: molecular structure determination, quantitative analysis of mixtures, and characterization of compounds in hydrocarbons and polymer mixtures, which could be extremely useful to researchers involved in this type of analytical

chemistry. Using an example, the reader is shown how to use the correlation charts. The fourth chapter deals with the chemical shift. A description of the summary charts (p 15) as well as the detailed charts (p 89) is given. This is followed by tabulated generalizations about the chemical and the factors that influence it. Chapter 5 deals with the coupling instant and is arranged in a manner similar to that of the previous chapter. The final chapter describes typical spectra which are grouped in plates (59) and are presented at the end of the book.

The book is an atlas which compiles an enormous amount of NMR information collected from 10,000 compounds.

Although structure-solving problems are dependent upon a number of instrumental techniques, one might be led to believe that the task can be accomplished almost completely by NMR. This can mislead the inexperienced reader, one of the potential users. The book is probably useful as a shelf reference in an NMR laboratory.

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Gonadotropins and Gonadal Function. Edited by N. R. Moudgal. Academic Press, New York, N.Y. 1974. xxi + 565 pp. 15 × 24 cm. \$19.50.

This book consists of over 40 papers which were presented at a symposium, "Advances in Chemistry, Biology and Immunology of Gonadotropins", held in Bangalore, India, in Oct 1973.

The first section, "Chemistry of Gonadotropins", deals primarily with the recent developments in elucidating the structure of LH, FSH, and hCG: the sequence of amino acid residues, the number and position of the disulfide bridges, and the existence of α and β subunits in the gonadotropin molecule. This section also contains two papers on the biological, immunological, and chemical characteristics of gonadotropins in reptiles and fishes, as well as two papers on the LH-releasing hormone (LH-RH) and other aspects of the hypothalamic control of pituitary function.

Section II, "Biology and Immunology of Gonadotropins", covers a wide range of topics including the relationship of the immunological and biological activities of the gonadotropins, the use of immunosorbents in the purification of hormones and antisera, fetal endocrinology, in vitro systems for gonadotropin assays, and the regulation of the various aspects of ovarian function by LH, FSH, and prolactin. Much of the data discussed in this section was generated in experiments with antisera to gonadotropic hormones.

Section III, "Biochemistry of Gonadotropins", begins with several papers on the mechanism of action of LH-RH and the possible involvement of cAMP and prostaglandins in mediating the effects of hypothalamic releasing hormones on the anterior pituitary. This is followed by a series of reports on the role of cAMP and prostaglandins in the action of gonadotropins on their target tissues and by several papers on gonadotropin receptors, their characteristics, and localization, as well as attempts at their purification. Other papers provide evidence that the seminiferous tubules and, more specifically, the Sertoli cells are the target for FSH in the mammalian testis and discuss the cellular events responsible for the increase in testicular protein synthesis, which is observed after FSH administration.

The fourth and final section, "Gonadotropins in Clinical Medi-

cine", consists of only four papers, two on monitoring the ovarian responses to gonadotropin therapy and two on the levels of LH and FSH in men, the pituitary-testicular feedback, and the treatment of various testicular disorders.

The book provides an extensive, though not necessarily complete, picture of the "state of the art" in the areas of chemistry, biological effects, immunology, and the mechanism of action of mammalian gonadotropins. Brief discussions of the hypothalamic regulation of gonadotropin release, use of gonadotropins in the treatment of human reproductive disorders, and several other topics help to put the bulk of information in proper perspective. The book should be a very valuable source of information and references for an individual entering the field of basic research on the properties, mechanism of action, and effects of gonadotropins. It could also be useful to a clinician interested in an overview of recent developments in this area. Graduate and medical students not directly involved in research on gonadotropins would probably find this book difficult to read and of somewhat limited use, because it consists of brief papers written clearly for a specialist and dealing with specific points of current research interest without providing much perspective or a general introduction.

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Lipid Metabolism, Obesity and Diabetes Mellitus. Impact upon Atherosclerosis. Edited by R. Levine and E. F. Pfeiffer. Georg Thieme Verlag, Stuttgart, Germany. 1974. vii + 194 pp. 19 × 27.5 cm. \$22.00.

Dr. Heiner Greten and his collaborators have edited a volume of short papers delivered at an International Symposium held in April 1972. The meeting and the book are divided into four parts: the first, Lipid and Lipoprotein Metabolism; the second, Obesity; the third, Diabetes Mellitus; and the last, Implications of Lipid Metabolism, Obesity, and Diabetes Mellitus on Atherosclerosis.

The participants in the symposium and contributors to this volume included many of the most eminent workers in the world in the field of metabolism and its relationship to atherosclerosis. As is often the case with symposia of this sort, each spoke about and wrote about an area of interest to himself and usually one actively under pursuit in his laboratory. Such an approach has both advantages and disadvantages. The advantages include that the work is current, usually pertinent to the important topics of the day, and clearly presented. The major disadvantage is that the book as a whole is disjointed, with little relevance between one section and another.

In this particular case, excellent brief reviews by workers such as D. S. Fredrickson, T. A. Miettinen, R. J. Havel, G. A. Bray, and A. Marble help to summarize the field in comprehensible fashion. Despite the rather steep price, this volume can be recommended for those with some knowledge of the field who want to bring themselves up to date. Although too short and too advanced for the beginner, it is of value for the expert, since it compresses a great deal of methodology and a number of important hypotheses and position statements into a rather slim volume.

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