

The third section, by A. Quayle and R. I. Reed, is the least satisfactory. Half of the five-page introduction to mass spectrometry is devoted to a consideration of the "z-number" classification, a concept which is utilized in discussion of half of the ten spectra presented. This concept is not widely used, and many teachers will find it very curious that this concept is included while there is no mention of the half-arrow notation to denote a one-electron shift. Furthermore, there is very little to indicate that any work on the mechanism of fragmentation has taken place. None of the extensive work of Biemann or Djerassi is referred to in the text, though these key workers in mass spectroscopy are recognized in the bibliography.

The reviewer is of the opinion that a need still exists for one or more additional works in which the advantages and limitations of each spectroscopic method are *comparatively* assessed through their *combined* application to organic structural analysis.

In the final analysis, this is a book which can be broadly recommended, especially for the excellent section of nmr spectroscopy and the sound, balanced approach to infrared spectroscopy.

Alex D. Cross
Syntex Research
Palo Alto, California

The Amino Sugars. The Chemistry and Biology of Compounds Containing Amino Sugars. Volume IIA. Distribution and Biological Role. Edited by ENDRE A. BALAZS, Institute of Biological and Medical Sciences-Retina Foundation and Harvard Medical School, Boston, Massachusetts, and ROGER W. JEANLOZ, Harvard Medical School and Massachusetts General Hospital, Boston, Massachusetts. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. xxvi + 591 pp. 16 × 23.5 cm. \$22.00.

Volume IIA of this projected series of a four-volume treatise comprises a survey of the distribution and biological role of the amino sugars and amino sugar containing molecules in a wide variety of living forms. It is divided into 20 chapters which cover the presence of these compounds in the living forms described. This book commences with Chapter 18 in this volume and includes contributions from 19 different authors, all of whom are specialists of the tissues and organs which are discussed. Most of the discussions are concentrated on mammalian forms. There is one chapter on the distribution in microorganisms, viruses, and invertebrates, by Nathan Sharon, which is an extremely good review of these forms. Especially is this so for the discussion of the bacterial capsular compounds. The value of this long chapter of 45 pages lies in its encyclopedic coverage of a wide range of bacterial forms and their varied amino sugar components. The presence of amino sugars in algae and lower forms of plant life is discussed, and the surprising conclusion is shown that these compounds are rare, or indeed only rarely found, in higher plants. The author refers to the difficulties of conclusive determination of small amounts of these compounds in the presence of other compounds such as sugars, amino acids, and other substances. He mentions the value which may be obtained in such studies with the use of ion-exchange resins. In the invertebrate animals the amino sugars are present as a form termed chitin, the composition of which is discussed at length by this author.

The book then quickly switches to mammalian systems with a discussion of the amino sugars and related compounds in liver tissue, in a chapter by R. G. Spiro. This is a well-written chapter including varied aspects of the metabolism of hexosamine and the sialic acids. Rather extensive coverage is made of the pathology of liver in aspects of abnormal carbohydrate metabolism related directly to the amino sugars and their associated molecular complexes.

A following chapter by the same author on kidney tissue follows the same pattern as the above with a discussion on the hexosamines and sialic acids and the results of pathology of this tissue to the metabolism of these compounds.

The following chapters of the volume switch to varied aspects of mammalian biochemistry. Chapter 22 by Z. Dische is a good survey of the mucous membranes and cellular excretion products of the living epithelium. A following short chapter by I. Werner and L. Odin on the glycoproteins of the salivary glands, saliva, and sputum completes this coverage of the cellular excretion forms of the amino sugars and derivatives.

The volume serves a valuable function in providing a large amount of information. However, like any collection of diversified mate-

rial written by different authors there is found to be a wide variety in the technique of reviewing the subject at hand. Some of the authors have obviously followed the usual *Annual Reviews* format and have given a list of work with no pertinent discussion. Typical of this is a statement such as "the rate of incorporation of X *in vivo* has been studied by Smith and Jones (1960)." This does not tell about the results obtained and leaves a legitimate question in the mind of the reader. This is often unfortunate because the book is intended both for the expert and the novice who are at the opposite poles in their knowledge of the pertinent literature. The authors are to be complemented, however, despite a few lapses into this style, by presenting an excellent view of the over-all field. In many cases it has been a difficult task because several of the surveys are new with no previous reviews to build on.

The editors are to be complemented in selecting, in general, competent authors. The organization of the chapters seems as if it could have been better arranged. A chapter by Lers Sundblad on "Glycosaminoglycons and Glycoproteins in Synovial Fluid" would seem to be more closely related to the earlier chapter by Z. Dische on "Mucuses and Mucous Membranes." This is a minor point and the chapters on special tissues such as blood cells, nervous tissues, eye and ear tissues have no obvious special order in a volume such as this.

The Bibliography and Author Index are very complete, and together with the Index they provide a valuable guide to the reader. The addenda in many chapters updates the information to 1964 so that, with the time of publication usually involved in a volume such as this, it is as up-to-date as it is possible to make it. It is to be hoped that an early revision of this volume will be planned to keep it abreast of the rapid expansion of knowledge in this field.

The volume is of great value for biochemists and carbohydrate chemists, and should fill a real need in providing a compendium of information in the field of the amino sugars and their related compounds.

Ernest R. M. Kay

Department of Biochemistry, University of Rochester
Medical School, Rochester, New York 14620

Theory and Principles of Electrode Processes. By B. E. CONWAY, University of Ottawa. The Ronald Press Co., 15 East 26th St., New York, N. Y. 1965. vii + 303 pp. 16 × 23.5 cm. \$7.00.

The author clearly and succinctly states the purpose and limitation of the book in the preface and introductory chapter. These are electrochemical kinetics of activation-controlled processes with especial attention to his and co-workers' contributions. Since Conway is one of the leaders of electrode kinetic research, these contributions are both considerable and important.

Most of the book is concerned with the structure of the metal-solution interface and its influence on electrode processes. The discussion is advanced and presupposes an understanding of chemical kinetics and basic electrochemistry. Conway gives an excellent, but brief, review of the theory of the double layer with especial attention being paid to the effects of dielectric saturation at the interface. Ionic and molecular adsorption is similarly treated. Here the application of the Temkin isotherm is stressed, and Conway shows how the use of this isotherm can conform kinetic theory with experimental fact for cases where the Langmuir isotherm fails.

The last two chapters briefly deal with selected problems. Kinetic theory is applied to the following important electrochemical systems: the hydrogen and oxygen reactions, corrosion and passivity, metal deposition and dissolution, ionic oxidation-reduction reactions, rapid electrochemical reactions, organic electrode processes, anodic films, stoichiometric numbers, and, in the last chapter, electrochemical field effects at the gas-metal interface. This chapter does not fit in with the rest of the book, but it is so short that it really doesn't matter. There is one short appendix listing "Basic Types of Mechanisms for Organic Electrode Processes" and 319 references.

Conway has written an excellent monograph that will be of value to many investigators and advanced students of electrochemistry. The printing, illustrations, and technical details of the book are excellent—and the price is right.

S. Schuldiner

U. S. Naval Research Laboratory
Washington, D. C. 20390