

## Book review

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*Advances in Carbohydrate Chemistry and Biochemistry*: Volume 37, edited by R. STUART TIPSON AND DEREK HORTON, Academic Press, New York and London, 1980, x + 436 pages + Author and Subject Indexes, \$49.50.

This volume begins with a fitting biographical tribute to William Ward Pigman by his colleague, Anthony Herp. Professor Pigman's vision, originality, and drive were responsible for the founding of this series. He was senior editor of the first four volumes, and was a member of the Advisory Board for years. In later years, he considered the establishment of this series to be his most important contribution to the scientific community. The excellent editorial quality of the first four volumes set the standard that has been maintained throughout the series. Thus, the tribute to Professor Pigman's life and work is especially appropriate.

The first review article is a comprehensive chapter by Clemens von Sonntag that brings up to date the rapidly developing subject of free-radical reactions of carbohydrates. The material is well-organized; it includes a description of types of free-radical reactions, followed by a discussion of radical reactions of selected compounds in solution. There is also a brief section, with numerous references, on radiation reactions in crystalline carbohydrates.

The authors, T. C. Crawford and S. A. Crawford, of a chapter on the synthesis of L-ascorbic acid provide a comprehensive and authoritative review of the enormous research effort devoted to the synthesis of this important vitamin. The chapter includes extensive details on the synthesis, not only of the vitamin, but also of its precursors. The results of various processes are critically and concisely evaluated. Chemists concerned with the many intermediates and transformations involved in the various syntheses of L-ascorbic acid will find this chapter of great value.

In the first of two chapters devoted to glycoproteins, Montreuil traces the discovery of the important concept that glycan moieties actually serve as biological information-carriers. Development of vastly improved physical, chemical, and enzymic methodologies has led to the determination of definitive structures for many glycoprotein glycans. The author reviews recent progress, and gives the reader a feeling for the state of knowledge in this fast-developing area of investigation. The discoveries recently reported are phenomenal, and the author's presentation of the subject is authoritative.

In another admirable chapter, Stowell and Lee discuss the synthesis, physico-chemical properties, and biological activity of neoglycoproteins (synthetic carbohydrate-protein conjugates). Applications of neoglycoproteins include their role as artificial antigens, as substrates for lectins, as substrates for the study of glycoprotein clearance and uptake systems, as material for the affinity chromatography of carbo-

hydrate-binding proteins, and as cytochemical markers for specific carbohydrates in electron microscopy. The chapter is concluded with a discussion of the many possible applications of neoglycoproteins, as the methodology for both oligosaccharide synthesis and protein modification continues to develop.

A chapter by Dey contains a wealth of information on the biochemistry, occurrence, physiological significance, and composition of a host of plant oligosaccharides and polysaccharides that contain  $\alpha$ -D-galactosidic linkages. Discussions of plant physiology, enzymic transformations, and metabolic reactions are especially thorough.

The final chapter, by Jeffrey and Sundaralingam, is a bibliography of crystal structures that were published in 1976 for carbohydrates, nucleosides, and nucleotides. The article continues the series published in four previous volumes of *Advances* (1974–1977). As in Volumes 32 and 34, the clear, graphic depictions of structure were computer-generated from the original coordinates. Ease of reference to the crystallographic data would have been enhanced by page-indexing *within* the chapter, thus avoiding a detailed search of the main index or a page-by-page perusal of the chapter itself.

This issue of *Advances* is a worthy addition to the series, which, from the beginning, has been distinguished by a unique and consistent excellence of presentation. The research scientist and the serious student, alike, will find it to be a rich source of ideas and information.

*The American University,  
Washington, D.C. 20016*

HARRIET L. FRUSH