

biology deals with chemotherapy, primarily anticancer and antiviral results, rather than with biochemistry. One could wish that a greater effort had been made to achieve a little better balance between organic chemistry, chemotherapy, and biochemistry. Only one discussion is completely concerned with chemotherapy, whereas many others report some results within the framework of the design and synthesis of compounds. Two papers are concerned with enzymology—one on irreversible inhibitors, and the other on tight-binding inhibitors. Most of the articles describe the synthesis of nucleoside analogs, usually with alterations in the nitrogenous base, some treatments being more mechanistic than others. Several papers discuss the specificities of glycosylation, and another expounds in detail on the formation of anomers of 2'-deoxynucleosides. The title of one paper, a very good one on the subject it actually covers, gives the impression that it discusses the mechanism of nucleoside synthesis in general, when, really, it only discusses the mechanism of Friedel-Crafts-catalyzed reactions. The subject of *C*-nucleosides is treated in four articles, and others are devoted to the synthesis of analogs of nucleosides that contain amino and thio sugars. The volume is rounded out by papers on analytical techniques (n.m.r. spectroscopy and liquid chromatography), protective-group chemistry, and polynucleotide chemistry. The last includes two papers, by Khorana's large group of workers, on the total synthesis of a gene. There is an index, but its usefulness is questionable, as it is barely even an outline of what is actually in the book. During reading, the reviewer recorded a significant number of important words and phrases, and later found that only about 20% of them were included in the index list.

This volume can be recommended to anyone working in the field. However, it must be mentioned that any investigator really cognizant of the primary literature will find little that is new herein. Nevertheless, it is useful to have the information, with references, summarized in one place. The book will be of most value to those breaking into the field, particularly graduate students and postdoctoral researchers. The price of the volume has been kept low, compared to the price of most specialized books these days, and everyone concerned with that effort deserves thanks.

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*Carbohydrate-Protein Interaction*, edited by IRWIN J. GOLDSTEIN, ACS Symposium Series, Volume 88, American Chemical Society, Washington, D.C., 1979, xi + 222 pages, \$22.50.

There is an emerging practice for presentations at symposia to be published in book form. This practice, although desired by much of the scientific community, leads to redundancies in the presentation of data and new conceptual material. The Foreword to *Carbohydrate-Protein Interaction* states: "Papers published in the ACS

Symposium Series are original contributions not published elsewhere in whole or major part and include reports of research as well as reviews . . .". Thus, based on the foregoing, readers of volumes in the ACS Symposium Series can justifiably expect the presentation of previously unpublished results, or of analyses and reviews of the literature. Only in the latter regard does the present volume fulfil its purpose.

Slightly more than one third of the book deals with lectins or lectin-carbohydrate complexes. Sharon *et al.* cover some of the literature on lectin-lymphocyte interactions and the effects of lectins on immune phenomena, but a superior review on the same subject had already been published by Lis and Sharon [in M. SELA (Ed.), *The Antigens*, Vol. IV, Academic Press, 1977, Chapter 7]. In a particularly lucid article, Karl Hardman discusses the nature of the carbohydrate-binding site on concanavalin A (con A); this is an important contribution in view of the controversy that existed for several years on the location of saccharide-binding sites in con A crystals. Papers by Brewer and Brown, and by Williams, Shafer, and Goldstein, deal with the binding of saccharides to con A in solution, but much of the information presented in these two papers has been published elsewhere during the past year. Poretz briefly describes the use of lectins to study cell-surface glycoconjugates. Evans and Wang discuss the effects of con A-subunit interactions on cell agglutination. Thomas *et al.* report on the circular dichroism of soybean agglutinin and the effects of saccharide ligand on the conformation of the protein. In terms solely of lectins, there is nothing in this book, save the paper by Hardman, to recommend its purchase. The best review on lectins was published recently by Goldstein and Hayes [*Adv. Carbohydr. Chem. Biochem.*, 35 (1978) 127-340.]

Interesting papers on anti-carbohydrate antibodies are presented by Zopf *et al.* and by Pazur *et al.* Jakinovich discusses the specificity of sugar taste-responses in an animal model; this terse description is recommended for researchers, as well as non-specialists. A rather lengthy, but well-written and exciting article on the interactions between glycogen-debranching enzymes, and phosphorylase, with glycogen and limit dextrins is offered by Nelson, White, and Gillard, but the "Contents" listed only Nelson and White as authors. Other reviews include discussions of the role of glycosidically bound D-mannose in the cellular assimilation of  $\beta$ -D-galactosidase, by Distler *et al.*; of hepatic receptors for serum glycoproteins in fish, by Ashwell and Morgan; and of the chemistry of proteoglycans, by Rosenberg *et al.*

It is fitting that I. J. Goldstein served as the editor for the book, as he has made numerous contributions to the study of protein-carbohydrate interactions. Also, his choice of participants was appropriate, as each of the laboratories represented has made significant advances in the study of protein-carbohydrate interaction. It is unfortunate, however, that information dealing with microbe-animal cell adherence-mechanisms is missing from the book.

A few mistakes were noted. These include ref. 1 in the paper by Williams *et al.*, a misspelling on page 64, and an incorrect caption on page 138.