alcohols and carbonyl compounds, terpenoids and steroids, flavonoids and related compounds, amino acids and proteins, nucleic acids and derivatives, alkaloids, porphyrins, and miscellaneous nitrogen and sulfur compounds. Various classes of compounds and literature references to recent work are well covered.

A considerable portion of the book consists of very large structural formulas. These will be useful to the student, but it is regrettable that more space was not given to an additional discussion of the compounds. The formulas are misleading in many instances because carbon-carbon bond distances and configurations are often not accurately represented. Several complex metabolic pathways are diagrammed in a style not as clear as that generally provided by published charts. Occasionally sweeping general statements, to which exceptions can be taken, are made.

The discussion of the role of flavonoids in the physiology of sexual reproduction in algae does not include citation to the critiques. The newer spectrophotometric developments which have now replaced the direct-vision spectroscope, especially for in vivo examination of the porphyrins, are not mentioned.

A useful summary of the naturally occurring organic compounds in higher plants is provided for investigators in various fields of botany, pharmaceutical chemistry, organic chemistry, and biochemistry.

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Natural Products Chemistry

Les Cyclitols. Chimie, biochimie, biologie. Théodore Posternak. Hermann, Paris, 1962. 491 pp. Illus. Paper, NF. 48.

Under the editorship of Edgar Lederer, the Hermann Press has undertaken an ambitious program of publishing, in the French language, a series devoted to the chemistry of natural products. This is the third book in the series, and it is concerned with nearly everything that is known about the chemistry and biology of the cyclitols and their derivatives.

The most common of the cyclitols are the inositols, and the author of this book, Théodore Posternak, has been active in research on the chemistry and biochemistry of these substances for most of his scientific career. Certainly few people have the same intimate knowledge of or feeling for the subject.

Now, what kind of a book is this? First, it is comprehensive. The section on chemistry goes into great detail, citing reaction after reaction, often with melting points and optical rotations of the products. Occasionally, detailed experimental procedure is given: for example, methods of chromatography; chemical and biological assays for myo-inositol; and, of questionable value, directions for the hydrolysis of phytic acid. Thus, in some respects, this is a handbook, and the almost 1300 literature references are particularly valuable as a guide to original sources.

Second, I think it is fair to say that this book is not "modern" in its treatment. The author does give considerable attention in the first chapter to conformation analysis and its applicability to the cyclitols, but the main emphasis is on systematic description, not reaction mechanism.

Such a sizable undertaking by one person has both advantages and disadvantages. On the credit side, it must be admitted that the book has a definite personality, which is highly refreshing in this day of fragmented authorship (and responsibility). As an example, I can refer to the manner in which Posternak deals with the troublesome problems of nomenclature, and his amusing defense for retaining the name meso-inositol in the face of a general movement in the Anglo-Saxon world toward the name myo-inositol.

The disadvantages are that the size of the job, the problem of rewriting, and the time required in getting to press have meant that the literature is integrated, in the main, only through 1958. To compensate, the author has thoughtfully included an addendum to cover the literature to 1961. The last 5 years have seen rapid advances in our knowledge of the biochemistry of inositols, and it is in this section that an informed reader will realize the material was badly out-of-date on the day of its publication.

Technically, the book is not printed or bound well. It has a soft cover, and some of the pages already were coming out of the copy received for review. The many figures are generally satisfactory, but the printing is so light that some of the numerical subscripts of the formulas are not legible. Some, such as the figure on page 111, are simply confusing; this is the result of an unfortunate arrangement of structural formulas and arrows. The structure of D-erythrose 4-phosphate on page 360 is represented by the formula for D-ribose 5-phosphate.

My conclusion is that although *Les Cyclitols* will have some general use, its greatest value will be to the specialist in cyclitol chemistry, and it will rank as a reference second only to the reviews under the same title that have appeared in two past volumes of *The Advances in Carbohydrate Chemistry.*

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Techniques of Research

Botanical Histochemistry. Principles and practices. William A. Jensen. Freeman, San Francisco, 1962. vii + 408 pp. Illus. $10.

Research in histochemistry has been dominated by those who have worked with animals since the 1920's, and most of the new advances have been made on animal materials. Indeed, only a few workers in plant science have been active in histochemical investigations; therefore, the publication of this book for botanists is fortunate, in as much as it will unquestionably stimulate botanical interest in the field. Plant scientists working in either basic or applied research will find many advantages in the use of microscopic and quantitative histochemical techniques since, by means of these techniques, it is possible to localize, identify, and measure substances and enzymatic activities in cells, tissues, and cell parts.

The first half of the book includes descriptions of equipment used, techniques for preparing tissue, methods of sampling and analyzing tissue, and procedures for isolating cell parts. In all descriptions of equipment, valuable sources of supply are given. The presentation of classical microtechnique is superb, but probably unnecessary, particularly in the case of old nonspecific staining methods, since there are many books on the subject. Methods of preparing tissues by freezing are well described and will also be helpful to workers outside the field of histochemistry—for example those who are inter-