cording to tissues and organs, and represents a pioneering effort on the part of the authors." It should be stated that the volume also contains a 45-page chapter by Nathan Sharon, much of it in the form of catalogs on the distribution of amino sugars in microorganisms, plants, and invertebrates. The rest, in a total of 415 pages plus an additional 128 pages of bibliography and index, deals mainly with mammalian organs and tissues.

The book is intended "for the newcomer to the field as well as for the expert." It has all the advantages and all the shortcomings of a book written by several authors, with varying experience and competence, in a field of interest to the most diverse groups, who apply a great variety of techniques to complex chemical and biological problems. The editors have faced a very formidable task in assembling the contributors and editing the contributions, a task met with in any comprehensive treatise written by a large number of authors. In general, the choice of authors has been good. Some of the contributions are outstanding examples of expertness, thoroughness, and critical evaluation: chapter 24 (by Pearce) on skin; chapter 31 (by Schubert and Hamerman) on cartilage, tendon, and intervertebral disc; chapter 33 (by Muir) on blood-vessel walls; chapter 35 (by Hakomori) on blood cells and hemopoietic organs; chapter 36 (by Svennerholm) on nervous tissues; and chapter 37 (by Balazs) on eye and ear. Some of the authors have chosen the easy road and have provided a recital of the published work which is reminiscent of *Annual Reviews*. Thus, the reader is left on his own in evaluating the evidence and the varying degrees of competence on which to base his additional reading.

The index and bibliography will be very helpful, and they appear to contain only a few errors. The gestation time of the chapters varied considerably—at least that is indicated by the literature quotations of the text with cut-off dates of 1962 to 1964, although the majority of the chapters contain appended literature references up to 1964.

In summary, the book has great merits and has the advantage of being unique in this field.

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The Nord School of Lignin Chemistry

Lignin Biochemistry. Walter J. Schubert. Academic Press, New York, 1965. x + 131 pp. Illus. $8.

Lignin is one of the major constituents of the cell wall of woody tissues of higher plants, but despite intensive study by many distinguished organic chemists, its structure has not been fully defined. There is more or less general agreement that some simple phenyl propane compounds may constitute monomeric units, but the nature of the linkages involved in forming higher molecular weight structures is not certain. There have been several "schools" of lignin chemistry in the past 40 years or so; the names of Freudenberg, Klason, Hibbert, Erdtman, Brauns, and Nord come to mind. This monograph is essentially representative of the Nord school, of which the author, Walter J. Schubert, has been a prominent member.

The basic and formidable difficulty faced by all lignin chemists has been that all methods of isolation yield modified preparations, usually in low yield, and that classical degradative procedures result in an array of simple compounds, the relationship of which to native lignin is unclear. Nord introduced the study of "enzymically-liberated" lignin obtained by extraction of fungally decayed wood. Although preparations from different sources are not identical, various criteria indicate similarity in basic structure.

This volume reviews succinctly and persuasively the lignin problem in the context of Nord's biochemical approach. There are four chapters: Chapter 1 presents a general discussion of the chemistry and isolation of lignin; chapter 2 deals with the aromatization process in micro-organisms through the shikimic-acid pathway; chapter 3 interprets this in terms of the phenomenon of lignification in the higher plant—the genesis and conversion of the "lignin building stones"; and chapter 4 discusses the microbial degradation of lignin—the identification of intermediate and final products and the enzymes involved.

This unpretentious but appealing book brings together theories of lignin structure and biogenesis that are plausible and reasonably well supported. It is, however, a criticism of the state of our knowledge that it is still necessary to resort to such unchemical terms as "primary building stones" for the monomeric compounds that in some unexplained way are linked together to form the lignin macromolecule.

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Endocrinology

The Parathyroid Glands: Ultrastructure, Secretion, and Function. Pieter J. Gaillard, Roy V. Talmage, and Ann M. Budy, Eds. University of Chicago Press, Chicago, 1965. xii + 353 pp. Illus. $15.

The Parathyroid Glands: Ultrastructure, Secretion, and Function, edited by Pieter J. Gaillard, Roy V. Talmage, and Ann M. Budy, contains papers presented at the second symposium on the parathyroid glands held in Noordwijk aan Zee, the Netherlands, 25 to 29 August 1964.

The book will be of interest to all students of endocrinology and will serve as a useful reference source for those working in the field. In general, the subject matter is timely and represents a concerted effort on the part of the participants to make public their most recent developments. The indexing, referencing, and editing are excellent, but the book falls short in two areas. The photographic reproductions, although adequate for superficial perusal, are generally poor. And, the text of the discussions has been deleted in favor of brief, rather sterile summaries by the editors.

In his introduction, Franklin McLean briefly discusses notable advances in parathyroid research and gives a perspicuous summary of the contributions of the symposium.

Although the book is divided into seven sections with separate category headings, the subject matter deals with four general areas: the ultrastructure and the histochemistry of the parathyroid glands, the chemistry and regulation of secretion of parathyroid hormone, the hypoclacemic hormone(s), and the mode of action of parathyroid hormone.

There are 23 papers. Some of the