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BOOK REVIEWS
Molecular Biology of the Photosynthetic Apparatus

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Molecular Biology of the Photosynthetic Apparatus is a collection of almost fifty invited papers contributed by the conferees of a NATO Advanced Research Workshop held at the Cold Spring Harbor Laboratory in May of 1984. The meeting and the resulting book brought a long-awaited and much-needed molecular biological perspective to the field of photosynthesis. This was perhaps the earliest possible date for such an event, since molecular biologists were just beginning to report their findings on those processes that the more physically-minded had been studying from the perspective of biochemistry and biophysics for years. In essence, a new field was opened, since the genes that encoded the information for the dark and light reactions of photosynthesis had finally been uncovered by the molecular biologists.

The organizers of the meeting were successful in highlighting the new findings from molecular biology in the context of important structure-function problems confronting photosynthesis researchers. This approach was taken for all of the major topics covered, including: photosystems I and II, bacterial photochemical reaction centers, light harvesting antennae, and ribulose bisphosphate carboxylase. Sections of the book are organized in such a way as to present the most advanced studies in both membrane protein structure-function studies and in molecular biology. This two-year-old book is predictive of a new mood in the photosynthesis field. Structural studies would be pushed to atomic resolution, and at the same time, the corresponding photosynthesis genes would be isolated and studied.

This is an essential book for specialists in the field, serving as a landmark reference for photosynthesis researchers. There are approximately one thousand literature citations in the volume, complete with titles. Hence, this work serves as a handy guide to pre-1985 literature. Much has happened since that time: complete sequences are known for chloro-

plasts, and the X-ray structures for reaction centers and Rubisco have been determined. However, I do believe that *Molecular Biology of the Photosynthetic Apparatus* will survive into the future as a much used reference, and perhaps, a starting point for students and newcomers to the field.

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CELLULOSE AND ITS DERIVATIVES

Chemistry, Biochemistry and Applications

J. F. KENNEDY, G. O. PHILLIPS, D. J. WEDLOCK, AND P. A. WILLIAMS, EDS.

Ellis Horwood Ltd., Chichester, 1985, 551 pp.

This book contains papers and posters presented at Cellucon 84, an international meeting on Cellulose chemistry held at the North East Wales Institute of Higher Education, Wrexham, Wales. The book gives an overview of modern cellulose chemistry, showing its practical applications and strong interaction with biochemistry and biology. Its intended readers would be cellulose chemists, biochemists, polymer scientists, carbohydrate chemists, physical chemists, food scientists, and analytical scientists.

The book contains 49 chapters divided into five parts. Part 1 deals with the structure and physiochemical properties of cellulose. It starts with a thorough introduction to the molecular and structural characteristics of the cellulose fibers, explaining how different parameters like chain length and degree of crystallinity affect the chemical reactivity of the cellulose. This gives the reader a valuable introduction to cellulose chemistry. Other chapters in this part describe the analysis of native and modified cellulose by use of chemical reactions and various spectroscopic methods, i.e., ESCA (Electron emission spectroscopy for chemical analyses) and cross-polarization, magic angle spinning (CP/MAS), and solid state NMR.

Part 2 of the book treats the biochemical, chemical, and radiation degradation of cellulose and lignocellulose. After a general review of this topic, follow chapters describing in more detail degradation of cellulosic systems by light, hydrochloric acid, heat, and ozone. Particularly interesting from a biotechnology viewpoint are the two reviews of the enzymatic degradation of cellulose by cellulases, describing the different sources and types of enzymes, as well as the mechanisms of cellulase action.

Part 3, the largest, is dedicated to cellulose derivatives and their industrial applications. The sixteen chapters cover both synthesis and anal-

ysis, as well as specific applications of various cellulose derivatives. Most attention is given to the economically important cellulose ethers such as carboxy methyl cellulose (CMC) and hydroxy ethyl cellulose (HEC). The review on the synthesis and applications of these cellulose derivatives, is one of the best chapters in this book.

Part 4 is titled cellulose as a matrix material. This part describes the use of cellulose and cellulose derivatives as materials for various applications such as clothing, paper, and board. Two chapters of special interest to the biotechnologist describe the use of cellulose matrixes for immobilization in biotechnology and the direct modification of cellulose in woody biomass and sludge.

The last part of the book contains the poster presentations. These presentations cover the whole range of cellulose chemistry and could have been included in Parts 1–4.

The overall impression of this book is such that it shows the diversity and interdisciplinary character of cellulose chemistry. It contains several excellent review chapters on important topics. The technical quality, however, is lacking with poor print quality, annoying misprints, and misplaced pages. Despite these objections, the book will be of great use, especially to those who are newly interested in cellulose and who want an introduction to this field of chemistry.

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