

BOOK REVIEWS

Heme and Hemoproteins

Edited by F. De Matteis and W. N. Aldridge
Springer-Verlag; Berlin, Heidelberg, New York, 1978
xv + 449 pages. DM 190.—, \$95.00

This is a most useful and valuable review of an important field. The eleven chapters of this book are written by scientists who have made important contributions to the various topics which they discuss. Our present state of knowledge is fully and critically discussed, and what is particularly impressive is that the various authors indicate clearly the large areas of ignorance and doubt which still make difficult clear or unambiguous interpretations of many of the problems.

The title of the book is somewhat misleading. The first chapter by G. H. Tait deals in a comprehensive manner with the various enzymes which are involved in the biosynthesis of heme and the early degradations. It also discusses the control of this biosynthesis and manages to give a large amount of critically-presented information on relatively few pages. The book also contains an informed and critical chapter on the effects of drugs on bilirubin metabolism by Rayner, Schacter and Israels, and the last chapter deals again in a most helpful manner with the toxic effects of lead, which is written by S. Sassa. All the other chapters, however, deal specifically with the biosynthesis and metabolism of heme in the liver, its regulation, and the disturbance of metabolism in a variety of diseases. The book does not deal with the metabolism of heme in the hemopoietic system, or in micro-organisms, or yeasts; but it gives a full and critical account of the present state of our knowledge with regard to the biological processes involving heme proteins in animal liver.

This organ has a particular role in the metabolism of heme proteins. Whilst a group of closely related proteins of the type of cytochrome *P*450 occurs in other organs, the liver plays a major role in the processes in which these proteins participate. Other heme proteins, such as tryptophan pyrrolase and cytochrome *b*₅ are also typical components of the liver, and thus heme metabolism of this organ is probably only second in importance to that of the hemopoietic system. In addition, most porphyrias are specifically connected with the liver, and for these and other reasons studies of heme biosynthesis in that organ is of special importance. Bock and Remmer have produced a most valuable review on the induction of hepatic hemoproteins in which both the great advances in our knowledge and the areas of our ignorance are equally well presented. The next chapter by Tephly deals with the inhibition of liver hemoprotein synthesis, which also brings some interesting facts to our attention.

Both clinical and experimental porphyria have stimulated special interest because most of them are associated with the increased production of biological intermediates and with an increase rather than a decrease of a particular enzyme, i.e., ALA-synthetase. The relation of the activity of this enzyme is therefore a key problem. De Matteis deals with one particular aspect of this problem in chapter 4, namely the loss of cytochrome *P*-450 caused by a

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variety of chemicals, and which may in turn affect either the synthesis or activity of ALA-synthetase. In the next chapter De Matteis gives an equally critical and comprehensive review of various types of hepatic porphyria. The following chapter by Elder deals with the porphyrias caused by various halogenated compounds, and fully and critically discusses the underlying enzyme abnormalities. The remaining chapters in the book deal with the effects of chemicals on heme biosynthesis by G. S. Marks, and the pharmacogenetics in heme metabolism. There is an overlap between the various chapters, but this is by no means a disadvantage. The chapter by Tschudy deals with an interesting and still not fully explained phenomenon of the 'glucose effect' in porphyria.

Altogether, the book can be recommended as a timely and critical account of our present state of knowledge of heme metabolism in the liver, and it can be recommended to all those who have a general interest in heme biosynthesis, in the complicated problems of regulation, and to clinicians and pathologists who must concern themselves with the metabolic diseases, and particularly with the disturbances of porphyrin metabolism which occur in so many types of disease.

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The Intact Chloroplast

Topics in Photosynthesis: Volume 1

Edited by J. Barber

Elsevier/North-Holland Biomedical Press; Amsterdam, New York, 1976

xi + 476 pages. \$57.25

This first volume of a series of three generally reaches a high standard and although most of the reviews and opinions are not particularly novel at least they are brought together here under one cover. The authors mostly restrict themselves to the consideration of the intact chloroplast of the higher plant although two chapters give predominance to algal chloroplasts. Where techniques make it feasible the treatment is of the intact chloroplast *in vitro*, exceptions arise where it has been customary or necessary either to investigate whole cells, as in studies of fine structure and of chloroplast-cytoplasm interrelations or to investigate broken chloroplasts as in the case of photophosphorylation where permeation of the chloroplast envelope by certain substrates is slow. The editor has allowed the contributors to develop their own individual approaches which two of them admit has permitted them to present their own biased view rather than an impartial review of the literature.

There is a great deal of detail in most of the chapters and this makes the volume quite heavy going in places. Another demerit is that the reader has to master 168 different abbreviations in separate lists for each chapter, there are duplicate abbreviations for 10 words and one abbreviation is used for two different purposes.

The first chapter by J. Coombs and A. D. Greenwood deals with the fine-structural aspect of the compartmentation of the photosynthetic apparatus. The electron micrographs are good although one deficiency is a lack of any pictorial representation of the thylakoid freeze fracture faces. Two rather biophysical chapters, in which the reviewer lacks competence, follow, one on electrical interactions and gradients by W. J. Vredenberg and one on ionic regulation by J. Barber. D. O. Hall has contributed a chapter on the coupling of photophosphorylation to electron transport while G. H. Krause and U. Heber provide a somewhat broader approach to the energetics of the intact