Birth of a membrane

Membrane Biogenesis: Mitochondria, Chloroplasts and Bacteria. Edited by Alexander Tzagoloff. Pp. xvi+460. (Plenum: New York and London, 1975.) $27.

THIS collection of articles attempts to review the present state of knowledge and direction of research concerning the mechanisms by which biological membranes are assembled. The various contributors are all expert in their field, and give accounts largely of their own work with only sufficient review material as might be necessary to provide perspective.

About 40% of the book is concerned yeast or *Neurospora* mitochondria, in articles from the laboratories of H. R. Mahler, A. Goffeau, A. W. Linnane, H. W. Weiss and R. A. Butow. The level of investigation described ranges from the more molecular (Weiss on cytochromes) to the more biological, and of the latter class most are concerned with nuclear–cytoplasmic relationships rather than membrane synthesis *per se*. How far the more biological levels of research will proceed towards a deeper understanding of membrane biogenesis rather than of mitochondrial genetics is not yet clear, and several of the articles would not be out of place in a volume that was dedicated to some subject quite different from membrane biogenesis. Nevertheless these excellent articles are representative of the field as it is and serve to illustrate the features of control and location that complicate the mechanistic aspects of membrane biogenesis in the mitochondria of eukaryotic cells. It is probably these very complexities which serve to divert workers on eukaryotic cells from some of the central problems of membrane biogenesis, well identified in Tzagoloff's introductory chapter. The same concern with nuclear–cytoplasmic relationships arises in the articles by L. Bogorad, R. J. Ellis and I. Ohad on the biogenesis of chloroplast membranes, which account for 33% of the book.

The remaining 27% of the book consists of articles by M. Inouye, L. Minditch and M. Bayer respectively on the outer, inner and outer-plus-inner cell membranes of *Escherichia coli*. The article by Inouye shows well the penetrating knowledge that can be acquired using molecular and biological approaches with *E. coli*: it could serve as compulsory reading for all who wish to work on membrane biogenesis, for it leads the way in setting up (and achieving) the sort of detailed mechanistic objectives necessary for an understanding of how cells assemble their membranes. Although the outer membrane of *E. coli* may not be very representative of more metabolically active membranes, the inner or cytoplasmic membrane certainly is. Yet there is only one article on the biogenesis of the cytoplasmic membranes of bacteria, and it deals largely with glycerol auxotrophs. The lack of further articles dealing in depth with the use of unsaturated fatty acid auxotrophs of *E. coli* is a notable omission. Also lacking is an account of membrane reconstitution, because a full description of membrane biogenesis will not be claimed until we have a cell-free reconstituted system that makes (or more likely, extends) membranes.

This book should recommend itself mainly to those who research on mitochondria and chloroplasts, but less so in view of its overall emphasis to those who work on bacteria. Teachers of advanced undergraduate courses should also find the book useful for reading selected topics by themselves and their students. As collections of specialist articles go, this book is a good one. Its faults are the usual ones—early obsolescence, and lack of overall balance. Its merits are the excellence and timeliness of the individual articles.

P. B. Garland

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lowing chapters deal with production, ecological energetic parameters and their measurement, and nutrient cycling. Clearly, the scenario is extensive and inevitably the treatment of different aspects is uneven. The unevenness is primarily a result of the data currently available and realisation of this does much to highlight areas where further research should be directed. Rodents in artic and temperate regions have been studied much more than tropical forms, small mammals other than rodents being less well known in all regions. In spite of the wealth of information provided in this volume it can be concluded that the study of small mammals is only just beginning.

Newcomers to small mammalogy will find this book invaluable for it will provide them with a backcloth against which they can develop and pursue new projects. Old hands will undoubtedly be grateful to the editors and contributors for the synthesis of data and ideas that have been developed over the last decade. A book well worth reading in spite of its somewhat high price.

John Phillipson

Fossil plants in palaeoecology

Paleoecology of Terrestrial Plants: Basic Principles and Techniques. By V. A. Krasilov. Pp. viii+283. (Wiley: New York and London; Israel Program for Scientific Translations: Jerusalem, October 1975.) £11.00.

PALAEOECOLOGY is primarily concerned with the reconstruction of past ecosystems from palaeontological and lithological evidence. It is a vast subject that is practiced by scientists of varying disciplines, including geology, botany, zoology, and archaeology. This book fills an important gap in the palaeoecological literature, as it is the first text devoted to the use of fossil plants in palaeoecology.

After a brief introduction in which basic concepts of ecology and palaeoecology are considered, the book is divided into three major parts. The first deals with the burial, transport, and fossilisation of plant material in a variety of sedimentary environments. The second part considers the reconstruction of plant morphology from fossil remains, the environmental deductions that can be made from morphology, and the evolution of plant form. The third part discusses the reconstruction of past vegetation and environment from both fossil pollen and macrofossil remains using a variety of qualitative and quantitative approaches.

These three parts are comprehensive and thorough, with numerous well-chosen examples drawn from a very broad spectrum of both the pre-Quaternary and Quaternary literature. Much of the information is critically assembled and evaluated, although some of the views are unsubstantiated and, in places, are erroneous. For example, the widely held belief (page 144) that the *Taxodium–Nyssa* communities of the south-east US are Tertiary relics has been shown by pollen analytical work in Florida by W. A. Watts to be wrong.

My major criticism of the book is the excessive and largely unjustified use of unusual and often bizarre technical jargon. Terms such as polymeric ecological hyperspace, anthracophobic communities, palynocoenum, xylocenosis, rhizocenosis, selectogenesis, geitogenesis, endoecogenesis, and cenophyllum make reading both difficult and tiring.

In spite of this criticism, the book can be strongly recommended to all botanically-orientated palaeoecologists whether of Quaternary or pre-Quaternary interests who wish to learn more about the basic principles of their subject.

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