

# BOOK REVIEWS

## Lipid Biosynthesis

*Biosynthesis of Acetate-derived Compounds.* By N. M. Packter. Pp. xii+203. (Wiley-Interscience: London and New York, 1973.)

THIS book is based on lectures to honours undergraduates at Leeds on lipid biosynthesis. First year undergraduates will find it too detailed, however, since the reader needs a good background in chemistry and enzymology to derive maximum benefit. It will be of use to postgraduates who are working in this general field, and to hard-pressed staff who are not specialists but nevertheless have to lecture on the subject. As the author claims, the book helps to fill the gap between the standard textbook and the specialised review. The title is somewhat ambiguous, for most metabolites will eventually be synthesised from acetate. Although a limited number of topics is covered, the book includes most aspects of lipid biosynthesis that are traditionally covered in an honours biochemistry course.

The first chapters deal in detail with pathways of fatty acid biosynthesis in animals, yeast, bacteria and plants. As with the rest of the book, emphasis is placed on the results (but not the details) of key experiments to elucidate these pathways. The chemistry and bioenergetics of individual steps are well described. Unfortunately, there is only a cursory treatment of "essential" fatty acids and prostaglandins. There follows a good summary of the control mechanisms involved in fatty acid synthesis, though it is weak on adaptive changes in the amounts of acetyl-CoA carboxylase and fatty acid synthetase in tissues.

After a somewhat brief but adequate description of triglyceride and phospholipid biosynthesis, the pathways involved in the formation of phenols and other polyketides are dealt with in detail. The author makes some interesting speculations about the reason for these fungal secretions, and the possible relationship between fatty acid and aromatic synthetase complexes. The last two chapters deal with the synthesis of cholesterol and sterols, and with a wide range of polyisoprenoid compounds.

It would have been useful if more emphasis had been placed on structure-function relationships (membranes are not mentioned in the subject index). But then it would have become a different book. The student reader would have benefited if the diagrams had been more imaginatively displayed and if the references had been clearly divided into reviews and original papers. The author index is somewhat unusual in that it

only refers to those who are cited by name in the text.

These are only relatively minor criticisms of a well written book which can be recommended to senior students, as well as to staff who are about to revise their lecture notes. R. DILS

## Cytochrome Updated

*Cytochromes.* By R. Lemberg and J. Barrett. Pp. x+580. (Academic: London and New York, July 1973.) £9.

IN Lemberg and Legge's *Heme Compounds and Bile Pigments* (1949) forty pages sufficed for cytochrome. As cytochromology has burgeoned, so have reviews, but all are eclipsed by this new encyclopaedia. What impresses is not just the colossal amount of information carefully sifted from the mushrooming cloud of papers on cytochrome but also the fact that the authors could still find time to correlate numerous scattered observations and to bring shrewd judgment to bear upon areas of doubt and controversy. For the most part cytochrome components are treated as entities and no attempt is made to cover to the same detailed degree their interactions in the respiratory chain. Likewise physiological aspects, biosynthesis and the evolution of cytochrome *c* are surveyed in lesser depth.

Chapters on the three classes of cytochromes *a*, *b* and *c* are perhaps the most valuable part of the book. They are unique in their detailed treatment and they bear the imprint of the authors' long experience in haematin chemistry. Writing on bacterial cytochromes the authors find themselves inevitably in a morass. The tendency of bacteria to produce variant and hybrid cytochromes, many inadequately characterised, makes orderly presentation difficult. A less detailed chapter might have been more readable, but its value as an information source would have been sacrificed. The authors' treatment of the respiratory chain, however, is enhanced by avoidance of factual detail. Leaving the supply of minutiae to others they provide original and stimulating discussion of the controversies surrounding electron transport and energy conversion.

In the early days of cytochrome living cells and tissues were the main objects of study. Subsequent urges to delve to molecular levels have pushed the subject of cytochrome in living organisms into a backwater. Lemberg and Barrett have done a service in devoting to such matters a chapter which should provide food for thought for cell smashers. Surprisingly, no account is given of Keilin's early experiments: the dis-

covery of cytochrome, the elucidation of its function and the concept of a respiratory chain stemmed from examination of living organisms.

The book concludes with concise and perceptive surveys of cytochrome biosynthesis and of cytochrome in evolution. The authors pose the question: what is the selective advantage for cytochrome *c* of a species-specific structure? The answer is simple—nobody knows. In speculating on possible advantages of specificity they draw attention to the quite inadequate comprehension of the detailed mechanisms of cytochrome catalysis. Increasing knowledge of individual cytochromes brings into sharper focus our ignorance of the masterplans of cell respiration.

Current nomenclature is based upon four cytochrome types *a*, *b*, *c*, *d*, wedded to a compromise between two numeration systems, one based upon order of discovery and the other upon absorption band wavelengths. Within this scheme are tolerated mavericks such as P-450. For newcomers in need of guidance the chapter on classification and nomenclature is scarcely adequate. The authors quote the recommendations of the Enzyme Commission on Nomenclature but, as is customary, they do not observe them. Their use of the style *c*-552, *b*-559 and so forth is acceptable but random changes to subscript wavelengths ("*b*<sub>6</sub>, *b*<sub>559</sub>, *b*<sub>3</sub>") bring unnecessary confusion. Greater confusion occurs among symbols for light absorption parameters (for example,  $\epsilon$  and  $E$  where  $\epsilon_{mM}$  is intended). This confusion reflects a regrettable lack of consistency among journal editors, and even within journals. To change all symbols taken from quoted papers to a uniform style would have been a Herculean task: of much greater importance was speed of publication. On similar grounds the occasional typing or typesetting error can be overlooked. In fact the book is remarkably up to date: a supplementary reference list includes papers published in 1972.

No worker on any aspect of cytochrome can afford to be without this thought-provoking book. As a guide to the literature and as a catalyst for growth of cytochromology it will have unique value. E. F. HARTREE

## Thymic Hormones

*Thymic Hormones.* Edited by T. D. Luckey. Pp. xviii+376. (University Park: Baltimore, London and Tokyo, 1973.) \$19.50.

It is sometimes supposed by the layman that the scientist is a stern man who deals in facts and whose work lacks