mistakes, and ambiguities of meaning, such as the following representative examples: 'This fits well with the ancient custom of precious metal bangles to ward off the situation we now know as arthritis', '. . . this information is too recent to have found its way in a very comprehensive review . . .', 'Prostaglandin structures possess the possibility of stereoisomerism', 'Of those of which the structure is known, are two venom kinins . . .', 'The state of knowledge of the role of prostaglandins in . . . is presently in a dichotomy'.

In conclusion, this book compares unfavourably with many other general reviews on prostaglandins, and certainly cannot be recommended. In any case, since it is priced at about £9 it is hardly likely to make a serious claim on the student's pocket.

Robin Hoult

*Gluconeogenesis: Its Regulation in Mammalian Species*

Edited by R. W. Hanson and M. A. Mehlman
John Wiley and Sons; New York, Sydney, London, Toronto, 1976
xxvi + 592 pages. £19.65, $35.40

Since study of metabolism and its control appears at present to be an area of diminishing research interest a volume entirely devoted to studies on regulation of a single metabolic pathway is something of a rarity. The occasion of Professor Henry Lardy's 60th birthday has provided the impetus to gather invited contributors from his former coworkers and friends in an area to which Professor Lardy has himself made and continues to make major contributions. Significant progress in understanding of the pathway and mechanisms of regulation of gluconeogenesis from various precursors began early in the 1960's and although the pathway now seems clearly defined, the regulatory mechanisms have for the most part defied identification despite more than 10 years of intensive investigation. Some new ideas are now emerging but it seems clear that proof of their importance will be as difficult to achieve as before. Indeed gluconeogenesis illustrates well many of the complexities which may arise in such investigations. Variants of this pathway exist in different species. The pathway involves participation of, and interaction between, at least two intracellular compartments. And part of the pathway appears to proceed by steps also used, although in the opposite direction, by another pathway hence creating several substrate cycles. In addition attempts to evaluate potential regulatory mechanisms for gluconeogenesis have been largely inconclusive, despite the fact that much effort has been devoted to this thorny problem.

One may then evaluate this book in two different ways. First, to what extent does it as a whole bring together, analyse and illuminate progress towards a full understanding of the role and regulation of gluconeogenesis? And second, how useful are the individual chapters in promoting this goal with respect to one or more of the potential sites of regulation? A rapid perusal of the book reveals that this is a typical multi-author volume. By their own admission the editors have made no attempt to correlate the content of the various chapters (other than by providing an extended summary of the contributions as an introduction) and indeed have allowed the authors to write in whatever format they wished with the result that research reports and analytical reviews are juxtaposed. It also seems clear that publication was delayed since some of the articles carry addenda and few references are made to literature published later than 1973. Those who are seeking a coherent incisive and up-to-date account and evaluation of the mechanisms which may be responsible for regulation of gluconeogenic-flux will be disappointed.

However, among the individual chapters there are a number of outstanding contributions which are of

considerable importance and will be of much interest to those working in this field. For example Utter and his coworkers describe studies designed to determine whether regulatory effect observed in vitro is relevant in a more intact system and have shown how conclusions drawn from comparison of kinetic constants determined in vitro and metabolite levels determined in vivo can be grossly misleading if estimates are not made of bound metabolite concentration in the in vivo system. This article illustrates the amount of information which would be required to perform a complete evaluation since binding data should in principle be obtained for all relevant enzymes in the particular tissue and species which is being studied. A somewhat similar approach is described in the article by Walter although without extensive consideration of the consequences of metabolite binding. In addition Walter also summarises his studies which clarified the confusion over the intracellular localisation of pyruvate carboxylase in rat liver. The role of anion transport in the gluconeogenic pathway is considered by Williamson and also by Shrago and his coworkers and Söling and Kleineke contribute a detailed examination of species variation in the pathway of gluconeogenesis which summarises a great deal of the available data on this subject and in addition includes much presently unpublished material. Although this latter chapter does not throw much light on the reasons for the observed species variability, it does gather most of the relevant information in one place. The initial stages of the very interesting studies on control of liver phosphofructokinase by phosphorylation are also described and it is only unfortunate that due to the delay in publication no mention appears of the formally similar mode of control of liver pyruvate kinase. The articles by Ruderman, Aoki and Cahill and by Owen and his coworkers on gluconeogenesis in human liver in both normal and disease states make most interesting reading and set the context into which the more detailed investigations must eventually be fitted. The appeal which this book will have to a more general audience is likely to reside primarily in these latter two chapters.

Therefore although certain of the articles in this book will be of much interest to workers in the field I cannot see that it is likely to have a wider appeal.

M. C. Scrutton

*The Intact Chloroplasts: Topics in Photosynthesis Vol. 1*

Edited by J. Barber
Elsevier Scientific Publishing co.: Amsterdam, 1976
xi + 476 pages. Dfl 140, $55.95

Research using isolated chloroplasts is now a major activity, as may be seen by the size of the Proceedings of the last International Congress on Photosynthesis! This makes it difficult for a worker in one part of the field to keep in touch with developments in related areas, and valuable insights may therefore be lost. According to the editor, the aim of the series 'Topics in Photosynthesis' is to produce reviews useful to both specialists and non-specialists. Each volume aims to develop a particular theme.

The theme of Volume 1 is the 'intact' chloroplast and so it begins with a very good review, by Coombs and Greenwood, of structural studies on chloroplasts. Unfortunately, they do not discuss the merits of different methods of chloroplast isolation nor the problems of working with intact or damaged chloroplasts: this is deferred until a brief consideration in Chapter 4 (by Hall). Isolated type A chloroplasts have a substantial degree of cytoplasmic contamination, which can confuse experimental results, and it might have been worthwile to point this out.

In Chapter 2, Vredenberg discusses ion movements and membrane potentials in chloroplasts: this account is useful because it includes references to much of the