

Excitation Energy and Electron Transfer in Photosynthesis: edited by GOVINDJEE, J. BARBER, W. A. CRAMER, J. H. C. GOEDHEER, J. LAVOREL, R. MARCELLE and B. ZILINSKAS. Martinus Nijhoff, Dordrecht, 1987, 372 pp. £51-25.

Most, if not all, phytochemists and plant biochemists will have a working knowledge of the process of photosynthesis. However, I suspect that, unless their chosen research field is closely related to that topic, they will not be familiar with the fine detail of current understanding of photosynthesis—and it is that fine detail that is covered by this volume.

The book is dedicated to the memory of the late Warren L. Butler, one of the doyens of the field of photobiology. His influence of biophysical aspects of photosynthesis is seen throughout the book, for example, his models to explain the characteristics of chlorophyll fluorescence pervade several of the 39 chapters in this volume. Each chapter has been written by a leading expert on photosynthesis. As might be expected, therefore, the book is both authoritative and reasonably up to date, including references to the primary literature of 1985. The chapters are arranged into six sections concerned, respectively, with the photosynthetic unit, pigment excitation and energy migration, reaction centres, electron transfer, O_2 evolution and bacterial photosynthesis. Each section starts with one or more overview papers followed by a number of rather more specialized research communications. It is not a book to be read from cover to cover (except, perhaps, by reviewers) but it does constitute an excellent reference work covering all aspects of the so-called 'light reactions' of photosynthesis. It will be invaluable for all research workers interested in the biophysical aspects of photosynthesis and an essential library purchase of all departments of biophysics, biochemistry and plant science. However, unlike the publishers, I do not see this book as being purchased by graduate students. At £51-25 it is too expensive and in addition I doubt whether

many chapters, even the overview articles, would be readily comprehensible to readers unless they already have a quite detailed knowledge of photosynthesis. Some of the terms used (e.g. optical cross section, random walk, hydrophathy index plots) were not always clearly defined and would mean little to the uninitiated. In addition several of the chapters were rather mathematical and likely therefore to discourage those readers from the less physical end of the biology spectrum.

However, having said that, my overall impression of the book was very favourable and I found it useful for updating my own lecture notes. I liked the idea that each chapter should start with an abstract, though a few of these were less helpful than I would have hoped. Nevertheless, as far as I could judge, all the chapters were well written. Those I particularly liked were the chapters by Geacintov *et al.*, Barber, Ames and Duysens, Govindjee and Eaton-Rye, Trebst and Draber, Shahak and Avron, Witt *et al.* and Knaff, but these were a personal choice and I would not wish to belittle the other contributors.

The book contains the usual sprinkling of typographical errors, though none that I found were serious. However, I was disappointed by the lack of an Index and, furthermore, I found the page numbering rather curious. Each page has two numbers and the number used in the contents section is that which is less obvious when flicking through the book. I imagine that this numbering system stems from the book's having been compiled from part of Volume 10 of the journal 'Photosynthesis Research'; nevertheless it was confusing.

In conclusion therefore, this is a valuable book that adequately updates the literature in this fascinating and fast-moving area of research. However it is a book for specialists, not for someone who lacks any background knowledge of photosynthesis.

Department of Biochemistry,
University College of Swansea

JOHN R GALLON

Immunology in Plant Sciences (Modern Methods of Plant Analysis. New Series, Vol. 4): edited by H.-F. LINSKENS and J. F. JACKSON. Springer, Berlin, 1986. 263 pp. DM 169 (DM 146 if the complete series is purchased).

In the last ten years the development of immunological procedures for use in plant analyses has been an important innovation. This volume forms an essential component of the New Series and should be expected to attract a large readership. In general the volume fulfils its purpose well in that it covers a broad range of immunological techniques, from antibody production to immunoassays, and, in most cases, provides detailed experimental instructions, usually associated with specific examples. Despite its 'Experimental' nature I found the book quite readable and many of the chapters are of high quality. However, it is very much a collection of individual contributions with little overall structure.

Four of the 12 chapters cover the immunoassay of small molecules, including plant hormones, phytoalexins and secondary products. These give comprehensive treatments of radio- and enzyme-linked immunoassays as well

as methods for coupling the haptens to protein to improve their immunogenicity for antibody production. The general principles of immunoassays are described in several chapters and I feel the editors could have avoided this unnecessary repetition. It might have been useful to have started with one or two chapters on theory and general methods in antibody production and immunoassays. Subsequent chapters could then be confined to specific examples of their use. The very long chapter by R. J. Robins on 'The measurement of low-molecular-weight, non-immunogenic compounds by immunoassay' gives a great deal of background information and could serve as an Introduction. Unfortunately it comes in the middle of the volume and was the last contribution on small-molecule immunoassays.

One of the most serious difficulties with the use of immunoassays in plant analysis, especially with small antigens, is cross reactivity and interference due to non-specific binding. This has been a considerable problem in plant hormone analysis and it is essential that before a new series of analyses is undertaken these effects are checked for and, where necessary, eliminated by further purification of the plant extract. A great deal has been