

Photosynthetic Systems: Structure, Function and Assembly: by S M DANKS, E H EVANS and P A WHITTAKER Wiley & Sons, Chichester, 1983 162 pp £5.95

This book has been written to provide undergraduate students of biological sciences with an introduction to the mechanistic principles which underlies chlorophyll-based photosynthesis. The authors' account does not neglect the photosynthetic bacteria and, indeed, places emphasis on the similarities between the prokaryotic and eukaryotic forms of photosynthesis. The book is not focused on any one specialised topic but provides a comprehensive overview of photosynthesis, encompassing such diverse subjects as the primary photochemical reactions and the origin and assembly of chloroplasts. Since the book is intended for students use, the authors have not given a detailed exposition of any subject, but provide lists of recent reviews at the end of each chapter to satisfy the reader's interest.

Each of the book's four chapters deals with a specific aspect of the photosynthetic process. Chapter one describes the internal structures of the photosynthetic systems. This chapter contains several electron micrographs which beautifully illustrate the species' differences in the spatial organisation of their thylakoid membranes. Chapter two discusses the enzymatic machinery which is bounded within the membrane to catalyse the conversion of the energy of sunlight to the chemical potential energy of ATP and NADPH. The metabolic pathways used to 'fix' carbon dioxide and their physiological adaptation to suit the plant's environment are described in the third chapter. Chapter four is focused on the chloroplast genome and involves a discussion on the possible endo-

symbiotic origin of chloroplasts from a prokaryotic ancestor.

I did find several inconsistencies throughout the text and, in addition, a few inaccuracies which might mislead the unwary student. One prominent error can be found in figure 2.32, where the redox midpoint potential of the photosystem 2 reaction centre P680 chlorophyll is about 0.5 V too negative. The outcome of this error is to have the electrons derived from the water-splitting reaction climb 'uphill' to reduce P680⁺. Moreover, the discussion of the control of the distribution of excitation energy between the two types of photosystem in chloroplasts is not up-to-date. It is now believed that the control is not through changes in the Mg²⁺ concentration in the stroma (p. 74), but is thought due to the covalent modification of the light-harvesting pigment proteins. The book does not refer to this elegant switch mechanism and compounds this oversight with the erroneous statement that the presence of Mg²⁺ induces the association of the two photosystems.

It is unfortunate that these inaccuracies detract from a book which has several favourable qualities. The book is clearly written, and in a style which was used by the authors in their earlier monograph on *Mitochondria: Structure, Function and Assembly*. Although several introductory texts on photosynthesis are available, the reasonable price, the pleasing presentation and the comprehensive coverage of the subject should make the book an attractive alternative to students.

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