Book Review

Is there more to plant reproduction?

Plant Reproduction, Annual Plant Reviews (Vol. 6)
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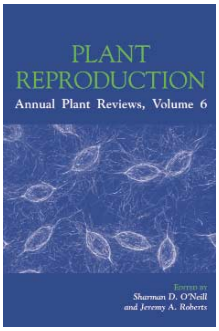

The editors claim that the 'Authors address all the major contemporary issues in plant reproduction'. Why then are there two chapters on floral induction? Why a chapter about petal senescence, in my view not a major contemporary issue in plant reproduction? I agree that self-incompatibility must be included, but why only gametophytic self-incompatibility? One chapter is largely restricted to ovule development and does not cover female gametophyte development. Chapter 4 ,'The developmental biology of pollen', is certainly comprehensive (67 pages), but even so, it omits any discussion of the progamic phase (pollen tube growth and delivery of the gametes to the embryo sac), an important phase of plant reproduction. Admittedly, in all such cases, the authors refer the reader to recent reviews that cover the omitted topics.

But these omissions are all the more disturbing because several chapters could do with some copy-editing. There is repetition within chapters. Example: in chapter 5, 'Plant embryogenesis – the cellular design of a plant', we are told in succeeding paragraphs that the dicot embryo has two domains, then that the monocot embryo has two domains, then that *Arabidopsis* (a dicot embryo) has two domains. Similarly, we are told several times that there are 15 000 cells in the mature embryo and that the shoot apical meristem has 110 cells, and then told in subsequent paragraphs that of these 15 000 cells the cotyledons comprise 6000 cells. Why is all this worth the space devoted to it? There is substantial repetition between chapters. Examples: the two chapters on floral induction discuss the same mutants; the *fertilization independent seed* (*FIS*) mutants are discussed in both the endosperm development and the apomixis chapters.

Several of the chapters are composed of paragraph after paragraph of acronyms and factoids: names of mutants, if known, the proteins the genes encode. But there is little or no synthesis or analysis. Figures would help, but one chapter has no figures at all, and most need more. Some statements will mislead the novice. Example: 'Reproduction in flowering plants is characterized by a highly reduced female gametophyte and endosperm initiated by double fertilization' (p.193, chapter 6, endosperm development). The term 'double fertilization' properly refers to one sperm fusing with the central cell and the other cell fusing with the egg.

Chapter 4 includes a multi-page table (Compilation of cloned microspore and pollen-expressed sequences) with information that is now more easily obtained by a database search. Chapter 4 also includes a detailed discussion of nucleotide sequences of pollen-expressed promoters, information that is probably of little interest to those not working in the field. On a positive note, Chapter 4 discusses several interesting phenotypes of mutants being studied by the author's laboratory (David Twell), many of which are still unpublished in the primary literature.

In spite of my overall negative impression, I enjoyed two thoughtfully written chapters. The chapter on 'The central role of the ovule in apomixis and parthenocarpy' (Anna Koltunow *et al.*) reviews the literature, draws conclusions about what the results might mean and points out where the field should go. For similar reasons, I liked the chapter on 'Self-incompatibility' (Jinhong Li and Ed Newbigin). This book might be worth a look if your library happens to have it, but otherwise you will be better served by reading reviews in *Trends* journals.

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Photosynthesis from a different perspective

Photosynthesis: Photobiochemistry and Photobiophysics (Advances in Photosynthesis, Vol. 10)
by Bacon Ke
Kluwer Academic Publishers, 2001.
EUR281.00/US$243.00/£175.00 hbk;
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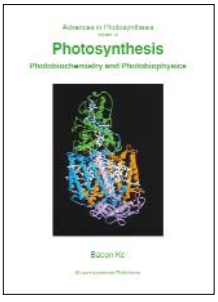

This is a rather unusual, maybe even improbable book. Certainly, it is different from other books in this series. Those have been multi-author, describing the current situation in a narrow area of photosynthesis research. This is a one-man history of photosynthesis research over the past 40 years or so. Its definition of photosynthesis is still pretty tight and concentrated on the real thing, that is, the light-activated processes occurring in reaction centres of plants and bacteria in the femtosecond to millisecond time range. No space is wasted on dark reactions involving soluble enzymes, and only chapters tucked in at the end for completeness touch on the intermediary cytochrome b_6f complex, proton translocation and ATP synthesis.

It describes in considerable detail one of the great achievements of 20th century science, the description of how photosynthesis works, and how the structure and function of the astonishingly precise molecular devices that carry out photosynthesis were resolved. During the period covered by the book, our understanding of photosynthesis has gone from a black box containing a few obvious complex chemicals to knowledge of structure at the atomic level and of process to the femto-second time scale. This is perhaps less generally appreciated than some of the star events in science are. It has been a team effort, even if a pretty bad-tempered team, involving a lot of people. Even the key events in the early 1970's, when the