

BOOK REVIEWS

S. J. OWENS

Plant Sperm Cells as tools for Biotechnology, edited by H. J. Wilms and C. J. Keijzer. *Pudoc, Wageningen, The Netherlands, 1988. Pp. 177. Dutch f. 90.*

This volume provides a valuable contribution to an area of plant science that has been, until relatively recently, largely ignored, particularly by Western scientists. It is a volume that I found very readable and informative, and is essential for the study of the sexual reproduction process in plants. The volume appears to have been the result of a workshop that included some 39 invited contributors. Professor Scott Russell was one of those contributors and much of the current interest in sperm cells is derived from his pioneering paper with Professor David Cass (Russell & Cass, 1981).

Unfortunately, the title is somewhat misleading, since much of the book is concerned with methods for examination and isolation of sperm cells, and with their morphology and ultrastructure, rather than with the use of plant sperms as biotechnological tools. The authors appear to have 'jumped the gun' with respect to biotechnological applications. In addition, readers should note that the generative cell (the precursor cell to the sperms) is included in at least two chapters, a feature not apparent from the title. There are 18 papers arranged in five sections, with all but two by joint or multiple authors. The first section, comprising just one chapter, is an introduction to the current status of sperm cell research and applications to plant breeding. Subsequent sections focus on male gametogenesis, the male germ unit, sperm cell isolation, and sperm cells and plant breeding. The principle modern methods presented and discussed are three-dimensional reconstruction techniques, antibody techniques for locating the cytoskeleton, and one method of confocal scanning laser microscopy. The isolation, storage and manipulation of viable sperm cells form another focal point, from which much of the subsequent genetic engineering techniques will be derived.

The species included in the papers are *Beta vulgaris*, *Brassica oleracea*, *Euphorbia dulcis*, *Galanthus nivalis*, *Gerbera jamesonii*, *Lilium longiflorum*, *Plumbago zeylanica*, *Spinacia oleracea* and *Zea mays*. Though the choice of species at first appears to be random, there are reasons beyond the obvious one, of crop plants. *P. zeylanica*, for example, has pollen tube delivery into the embryo sac without the aid of synergids, which may make observations of fertilization easier. It was also the plant that originally stimulated the recent interest in the field (Russell & Cass, 1981). Research on *Brassica* is part of a wider programme, which includes studies on self-incompatibility. What is affirmed is that only very few species have been studied to date, and that a considerable effort was required to obtain such data. This being so, the description of a male germ unit (MGU) may be premature as it is based on such a narrow database. Professor C. Dumas, who was involved in coining the term MGU, ably reviews the subject.

Most papers are short, six being five pages or less (including micrographs, diagrams and references but excluding colour plates), the rest being 10 pages or less. There are 15 good quality, colour plates plus additional legends on pages 153–177 at the back of the book. The chapter in which a colour plate is included is referred to at the top of the plate, and its legend either appears beneath the plate or on a legend page facing the plate. Inclusion of chapter and paper titles would have improved the speed of location of colour plates in relation to the text.

The volume lacks data on nuclear form and architecture, and comments only briefly on gene activation and expression in generative and sperm cells.

RUSSELL, S. D. & CASS, D. D. (1981). Ultrastructure of the sperms of *Plumbago zeylanica*. I. Cytology and association with the vegetative nucleus. *Protoplasma* **107**, 85–107.

Dr Owens is a cell biologist working at the Royal Botanic Gardens, Kew

T. C. HSU

Working with Animal Chromosomes, by Herbert C. Macgregor and Jennifer M. Varley. *Second edition, John Wiley & Sons, Ltd, 1988. Pp. xv + 290. £22.50, paperback*

One of the most long-lasting contributions of the late Professor C. D. Darlington was his book 'The Handling of Chromosomes', published in 1942 with L. F. La Cour as co-author. I am quite sure that most students in cytology read this book many times during the ensuing three decades for consultation as well as for the enjoyment of seeing the many beautiful photographs of chromosomes. I lost two copies and finally purchased the 1960 edition and kept it home to avoid another stealing.

However, during the last two decades, cytogenetic technology, especially that of human and mammalian cytogenetics, made so much progress that there was an urgent need for a new book to cover both classic and modern cytology. In the early 1980s, a representative of a publishing company persuaded me to prepare such a book. I actually drafted three chapters, but discontinued my effort after seeing the new book by Macgregor and Varley *Working with Animal Chromosomes* published in 1983 by John Wiley and Sons.

Working with Animal Chromosomes combines descriptions of classic and contemporary methods. If I had the nerve to continue my manuscript, I might have placed different emphasis and used a different writing style, but there was no reason for me to spend a lot of time to add little. My only wish was that the book would be revised in a few years to incorporate descriptions of several new technological advances being developed at that time, especially indirect immunofluorescence. But the 1983 version was so useful that to prevent it from playing another Houdini, I kept the copy in my office so well hidden that I later had a hard time finding it.

I am very pleased to read the second edition, which granted my wish to have several pieces of new information added, including indirect immunofluorescence, surface spreading of synaptonemal complexes, isolation