

*Introduction to Molecular Embryology* Second, totally revised and enlarged edition. By J. BRACHET and H. ALEXANDRE. Berlin, Heidelberg, New York, Tokyo: Springer-Verlag, 1986. 229 pages. Soft cover DM 39, ISBN 3 540 16968 7.

This book presents an up-to-date account of how the techniques of molecular biology are being applied to the complex problems of embryology. The discussion follows the natural order of events from gametogenesis to the early stages of embryonic development and differentiation, with due attention to diverse aspects of nuclear cytoplasmic interaction. The comparative approach addresses the classic problems of embryology, drawing on evidence from *Acetabularia*, mammals, amphibia, echinoderms and other invertebrates, although *Drosophila* is disposed of rather briefly. The authors are eager to develop the implications of the flood of new experimental evidence but they do not conceal how much of the mystery remains, sufficient to tax the ingenuity and imagination of experimental biologists for the foreseeable future.

The senior author (J.B.) has been active in the game for a long time, since the introduction of Dische's diphenylamine method of estimating DNA and the time when RNA was thought to be confined to plant cells, and has lived through a remarkable transformation of his subject, never faster than since the first edition of this work about a decade ago. This personal involvement imparts a unity and coherence to the account, so often lacking in research reviews. There is also a sense of historical perspective since the early workers are not forgotten. It is worth being reminded how far the theoretical views of say T. H. Morgan on embryonic differentiation have been vindicated half a century later.

The style of presentation is succinct and readable, accessible to the non-specialist as well as the student. The illustrations are clear. Although the reference list is very modest the recommendations for further reading at the end of each chapter compensate well enough. This is certainly a book to add to the library list.

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*Developmental Mutants in Higher Plants*. Edited by HOWARD THOMAS and DONALD GRIERSON. [Society for Experimental Biology Seminar Series No. 32. Cambridge University Press, 1987. 287 pages £25.00 (\$39.50), ISBN 0 521 32844 6.

The thirteen papers in this symposium deal with different aspects of plant development, which have been revealed by the study of mutants. The number of mutants already known in both crop and ornamental species is very large. They span a wide range of effects on plant morphology, physiology and biochemistry.

As the editors note, by analogy with animals and micro-organisms, there is immense potential scope for integrating the techniques and concepts of the different disciplines in unravelling the effects of mutant genes. Given the role of selection for mutants in plant domestication and their relevance to taxonomic distinctions, such information will also add a further dimension to evolutionary interpretations and will often prove directly relevant to agricultural or horticultural practice. So, on all counts, the publication of the present volume is timely.

The stated intention was not to aim at a comprehensive survey but rather to direct attention to general biological principles and also the respects in which plant development differs intrinsically from that of animals. It is no surprise that the level of analytical sophistication varies widely, according to the aspect of development or physiology chosen for comment, ranging from basic description of the phenotypic effects of mutant genes to application of the latest molecular techniques. The style of presentation also varies. Some of the papers carry a lot of technical information, others are cast in a more theoretical mould. Perhaps the best way to indicate the scope and variety of the contributions is to summarize briefly the main themes.

Gottlieb and Ford advocate an integrated developmental and genetic study of discrete, morphological differences of taxonomic significance, to determine their often simply inherited primary developmental causes. This approach is illustrated by their investigation of the differences between two closely related, annual, diploid Californian composites, *Layia discoida* and *L. glandulosa*. The more widespread putatively ancestral *L. glandulosa* has conspicuous ray florets which *L. discoida* lacks. There are also other floral differences in the involucre bracts, disc floret number and pappus size. Electrophoretic comparisons indicate a high degree of genetic similarity between the species, which are fully interfertile. The genetic analysis and developmental comparisons are presented in some detail. Two loci are involved in the determination of presence or absence of ray florets, although additional genetic differences affect floret number and size. On present evidence the authors favour a model in which a difference in the timing of growth of the peripheral florets, relative to their bracts, determines whether or not they become accessible to ray inducing signals.

Martin, Carpenter, Coen and Gerats present anthocyanin synthesis as a relevant model for understanding morphogenetic regulation. This theme is developed in comparisons of mutations in *Antirrhinum*-which affect the steps from the intervention of chalcone synthase to the formation of the anthocyanidin 3- rutinosides, a sequence which includes at least seven enzymes. Transposable element insertion at two loci, coding for either chalcone synthase or an, as yet unknown, enzyme are proving valuable sources of informative