

EVOLUTION AND SPECIATION—ESSAYS IN HONOR OF M. J. D. WHITE. W. R. Atchley and D. Woodruff. Eds. Cambridge University Press. Pp. ix+436. Price £30.00.

These twenty individual and independent contributions by colleagues and associates of M. J. D. White, assembled in honour of his 70th birthday, provide a diverse assortment for a single volume. The editors must have had difficulty in finding an all-embracing title, and if they tried to arrange the material into a logical sequence it is not apparent to this reviewer. However, perhaps this does not matter so much when many of the individual contributions stand in their own right as authoritative and stimulating essays on aspects of speciation and evolution. As might be expected, most papers have a cytogenetic emphasis, and the clearest theme running through the book is appropriate enough; the search for an answer to the question of whether chromosomal changes are causal or consequential to the initiation of speciation events. Bernard John sets the scene by performing a masterly demolition job on the case for speciation mediated by chromosomal change. Surveying the ruins of chromosome speciation theory after John's contribution, one wonders—"Where do we go from here?"

The underlying difficulty is our continuing ignorance of the genetic consequences of chromosomal change. Fortunately many of the other contributions to this book provide some hope that things are moving in the right direction. At the molecular level, Peacock and his co-workers describe how the originally simplistic ideas about the nature and role of heterochromatin are being replaced by a fuller recognition of its structural and functional differentiation. Such knowledge will surely lead to a better understanding of how chromosomal rearrangements affect gene expression, although it will also encourage further speculation—for example, by Bush in this volume—on how changes in gene regulatory systems resulting from such rearrangements might initiate speciation events. However, to gain insight into the wider adaptive and evolutionary consequences of chromosome repatterning we clearly need a broader knowledge of the workings of genetic systems. Towards this end Hayman provides a useful and admirably concise review of the little that is known about mammalian genetic systems, and there are several other papers—Oliver on ticks, King on lizards, Crozier on ants—which illustrate the diversity of genetic systems in the animal kingdom and hence the wide range of evidence that needs to be accommodated into one's ideas about chromosomal evolution if they are to have any general significance.

Studies of hybrid zones may not help much in deciding how speciation events are initiated, but they do seem likely to provide some insight into the nature of the intrinsic barriers to gene flow which arise between diverging taxa. The three papers on hybrid zones complement one another nicely. Barton & Hewitt give a useful general survey, Shaw provides a more detailed account of hybrid zones in Orthoptera where the genetic significance of chromosomal differences between interacting populations is a matter for interesting speculation, and Woodruff looks towards a future understanding of the genodynamics of hybrid zones, viewed from a standpoint of his work on Australian frogs and West Indian snails. Another significant contribution on the subject of isolating mechanisms is Littlejohn's attempt to re-examine the concept of reproductive isolation in terms of the individual's need to maximise its own fitness, rather than as a population phenomenon. He extends Paterson's ideas on the positive nature

of mate selection processes, reviews the evidence for reproductive character displacement and advances a definition of biparental species framed strictly in terms of individuals.

Other contributions to the volume range from a mathematical analysis of B-chromosome population genetics in the Composite *Brachycome dichromosomatica* (by S. Smith-White and C. R. Carter) to speculations on the evolution of insect storage proteins (by J. A. Thomson). The diversity of the subject matter and the range of opinions, arguments and informed speculation in this book are testimony to the unique contribution that M. J. D. White has made (and continues to make) in the study of evolutionary processes, not only by his own work but by stimulating the thought processes of others.

R. L. BLACKMAN

*Department of Entomology, British Museum (Natural History),
London SW7 5BD*

THE GENETIC BASIS OF DEVELOPMENT. A. D. Stewart and D. M. Hunt. Blackie, Glasgow, 1982. Pp. ix+221. S/B £8.95 or H/B £18.95.

Blackie's "Tertiary Level Biology Series" is intended for advanced undergraduates. This latest addition (actually published in 1981) fits into the format of the series by assuming the reader already has a good grasp of eukaryote genetics and classical embryology. Perhaps inevitably, it repeats some of this basic information in the first five chapters. Such topics as DNA constancy and sequence organisation, cytoplasmic control and maternal effects, chromatin structure and transcription will probably be quite familiar to advanced students from previous courses. The next three chapters are indeed more advanced explorations of the interface between development and genetics, emphasising genetic interaction and regulation by means of some twenty examples drawn overwhelmingly from fruit-flies and mice. I regard them as the essential nucleus of the book and regret that they only occupy one third of its pages. The examples and their implications are described succinctly and prove a rewarding exercise, even when the developmental connection is only speculative. The effect is somewhat disjointed, however, and anyone unfamiliar with a particular example might experience some difficulty in appreciating its characteristics and significance. Expecting to find these topics drawn together into a coherent synthesis, I was disappointed by the final chapter on mammalian sexual differentiation which seemed inadequate for this purpose and rather discursive.

This book successfully describes the contribution of genetics to some embryological problems. It exaggerates the importance of that contribution, of course, but that should not deter its intended audience nor displease readers of this journal.

H. WALLACE

Department of Genetics, University of Birmingham

BASIC POPULATION GENETICS. B. Wallace. Columbia University Press, New York. 1981. Pp. xii+688. Price £12.95.

This is the successor to Bruce Wallace's well-known book *Topics in Population Genetics*, published in 1968. As is suggested by the title, it is intended