

BOOK REVIEW

GENETICS. John R. S. Fincham. John Wright and Sons Ltd. 1983. Pp. XVIII + 643. Price: £12.50 P/B.

This is an outstanding book. To cover the whole of genetics in a single volume is a daunting task and to do so in such depth is a remarkable achievement. The most notable features of the book are its accuracy, its balanced judgments on controversial issues over the whole range of the subject, and the conciseness, clarity and elegance of the writing. One is left with a feeling of astonishment at the progress that has been made, particularly in the last decade, of amazement at the complexity of living matter, and of excitement at the prospect of surmounting some of the many challenges that lie ahead.

The first chapter, entitled “Cells, DNA and Chromosomes”, is concerned primarily with the self-replication of living organisms, with an appendix on transcription and translation. Then follow a series of chapters describing the various methods of genetic analysis in eukaryotes and what their application has revealed: segregation, linkage, recombination, chromosome variations, mitochondrial and plastid genes, polygenes, and parasexuality. These chapters include reviews of the mechanism of recombination, the analysis of continuous variation, and the application of parasexual methods to mammalian cells. Two chapters follow dealing with bacterial plasmids and phages, including the techniques for artificial cloning of DNA in them, and the occurrence of transposable elements. The next four chapters are concerned with genes, whether prokaryotic or eukaryotic: how mutations arise or can be induced, how they can be used to analyse gene function, how nucleic acid probes are revealing the structure of the genome, and how the genome is organised. Here the discussion includes consideration of overlapping genes, introns, gene clusters, and “ignorant” and “selfish” DNA. There are two chapters on differentiation, concerned respectively with its genetic control and the underlying molecular mechanisms—still largely conjectural. Among the subjects considered are the extraordinary process of mating-type switching in yeast; the long-standing riddle, now nearly solved, of the sources of antibody diversity; and the causes of cancer. There follows a chapter on population variation and evolution, including an assessment of the neutralist and selectionist viewpoints on polymorphism. The final chapter is concerned with human genetics and touches on genetic counselling and some controversial issues such as racial differences. To have each facet of all these parts of the science fairly assessed, and the prospects for future progress analysed, provides fascinating reading. In each chapter, sources of the work described are indicated by reference to lists at the end of the book. Each chapter ends with a summary and perspectives, selected further reading, and a set of problems. Some of these are quite difficult, but solutions are given at the end of the book.

As the author admits, he has made no attempt to treat the subject historically. This has occasionally led to errors: sex-linked inheritance was

first discovered by Doncaster in the currant moth *Abraxas*, not by Morgan in *Drosophila* (p. 85) and Hardy and Weinberg were not joint authors of the theorem that bears their name (p. 521). There are a few other minor errors, particularly in the chapter on chromosome variations. Typographical errors are few, but there are rather numerous incorrect cross references. A few trials of the index indicated that there is room for improvement there too. The book is copiously illustrated with photographs and diagrams, mostly excellently reproduced, but there are one or two in Chapter 17 where a lens is needed to distinguish hatching from stippling.

The book is addressed to "the student or other scientifically interested reader with no previous knowledge of the subject". I fear, however, that many will find parts of the book difficult, on account of the technical terms and the complexity of the subject. There is no glossary and some of the terms creep in without adequate explanation. But, for those with some background knowledge this masterly survey will give them, not only a splendid balanced picture of the subject, but a sense of wonder and excitement. Biologists owe a great debt to John Fincham for undertaking the gigantic task of writing this book, and to the publishers for the high quality of the production and for making it available at such a reasonable price.

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