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Book reviews

Introduction to Theoretical Population Genetics. Biomathematics, Volume 21. T. Nagylaki. Springer-Verlag, Berlin. 1992. Pp. 369. Hardback, price £35.50. ISBN 3 540 53344 3.

W. J. Evans once described population genetics as the mathematical investigation of changes in the genetic structure of populations (brought about by various processes). That was in the preface to a book in a series on applied probability and statistics. This book is volume 21 of the successful Springer Biomathematics series, so it is not surprising that a similar feeling pervades it. For Nagylaki, population genetics relates to genetic structure and also to evolution, but not to the real hum and bustle of that low land; there are no organisms in the subject index, unless one includes de Finetti, Jensen (of the inequality), Lagrange, and so forth, up to Weinberg and Wright. The application is principally to human genetics and to animal and plant breeding. The accent is on rigorous development of aspects of the theory using calculus and recursion relations but not including diffusion theory.

The treatment begins with a brief introduction and then an account of the factors modifying gene frequency in haploid populations. This is followed by the introduction of sexually reproducing diploid populations, with population subdivision, *X*-linkage and two loci. The various factors which affect gene frequency – selection, non-random mating, drift and inbreeding, and mixtures of factors – are then dealt with in detail in six further chapters. Migration-selection models are discussed lucidly, although for the authors' own more advanced contributions to this field we are referred to other publications. The final chapter is on quantitative models, ending with a consideration of mutation-selection balance as the major contributor of genetic variability to quantitative characters. Each chapter concludes with a set of problems which are often taxing and extend the treatment of the text. The price is high, but not unduly so.

I have dipped into selected parts of the book and find the accounts of the particular aspects concerned helpful and illuminating. It will continue to be a companion in this way. The text is a revision of an earlier set of published lecture notes and it is recommended as the basis of a one-year course, presumably at the undergraduate level. There must be cleverer or more dedicated students in the U.S.A. than we have here, because it is difficult to imagine a biology class in the British system taking it on board and persevering for a year. There would be too few volunteers for an option to be viable in the present economic climate. If this is the basic course book, then at the advanced level to which it leads, theoretical population genetics is indeed a branch of applied mathematics as Ewens claimed, rather than a branch of genetics.

Laurence Cook
School of Biological Sciences
University of Manchester
Manchester
U.K.

Molecular Biotechnology, 2nd edition. S. B. Primrose. Blackwell Scientific Publications, Oxford. 1991. Pp. 196. Softback, price £18.95. ISBN 0 632 03053 4.

Molecular Biotechnology conjures up, for this reviewer, images of factories – perhaps made from the components of living cells – busy churning out the exciting new designer-products of the 21st century. It was therefore rather a surprise to find myself struggling to maintain my interest as I waded through the book.

There is certainly no doubting the thoroughness of the volume and as a reference source it will be invaluable. As one involved in the teaching of an MSc in Biotechnology I have already plundered it for examples. It has, however, the rather dubious quality of having turned stories of really exciting work into a dull catalogue of examples. This has a lot to do with the rather old-fashioned style of presentation. One is stuck in an apparently open loop: introduction to a technique, discussion of its variations, selected of examples. How much more interesting it would have been to have used the examples themselves to introduce the techniques.

The contribution to be made by molecular biologists to the biotechnology revolution was greatly advertised in the early days, although the shortage of obvious money spinners in the short-term led to much unnecessary eating of words. These techniques have now come of age and the book represents a justifiably unabashed celebration of them. I was a little uncertain about the target audience for the molecular biology content, however, and felt that the coverage was a little superfluous for the expert yet too insubstantial for the novice. There was also a slightly irritating tendency to use slang terms: 'oligos' (oligonucleotides), promoter 'strength' (efficiency?), and codon 'choice' (useage?). I don't think that this is a text book designed to introduce new readers to the practice of molecular biology techniques.

The book is, however, successful in introducing readers to the very broad range of activities encompassed by the term Biotechnology. As the subject enters the curricula of more

and more universities, this book will serve as a useful bridge for third year undergraduate biological science students who need, and want, to know a little more about their science outside of the test tube. There are sections on the culture of microbial, animal and plant cells, cell and enzyme immobilisation, monoclonal antibodies and even human gene therapy. The sections on scale-up and reactor design are not at all frightening. Now that knowledge, creativity and wisdom have become intellectual property it was nice to see a section on patents.

There are superior volumes on recombinant DNA, such as the excellent *Recombinant DNA* by Watson Gilman, Witkowski and Zoller (Blackwell Scientific Publications, 1992) and much more detailed texts on Biotechnology, such as *Basic Biotechnology* by Bu'lock and Kristiansen (Academic Press, 1987) and *Principles of Biotechnology* edited by Wiseman (Blackie, 1988). There is a clear opening in the market for a book which marries the two subjects; this book has brought them closer.

RICHARD M. WALMSLEY
Department of Biotechnology and Applied Molecular Biology
UMIST
Manchester
U.K.