

(Newton–Raphson, Fisher’s Scoring, EM). The section concludes with two chapters on variance component estimation for more specialized situations, namely binary response data (Knuiman and Laird) and nonlinear models (Smith). Section IV, on prediction and estimation of genetic merit, begins with two chapters (Gianola, Im and Macedo; Harville) on the general Bayesian framework for prediction of breeding values, but the repetition is not a bad thing for the uninformed. Harville’s paper is particularly useful in its systematic comparison of Bayesian and frequentist approaches. The final chapter in this section is a comprehensive examination of the important, but little researched, area of connectedness (Foulley, Bouix, Goffinet and Elsen).

Section V covers prediction and estimation in nonlinear models and begins with a general review of methods (Thompson) followed by contributions on specific topics: growth models (Laird), censored observations (Smith), and discrete polygenic traits (Foulley, Gianola, and Im). Section VI on selection and non-random mating again begins with the frequentist (Henderson) and Bayesian (Fernando and Gianola) viewpoints, the frequentists’ aim being to ensure that the property of unbiasedness is maintained despite selection or non-random mating, whilst the Bayesians are happy to sacrifice unbiasedness to achieve faster genetic progress, although a generalised solution is elusive. In the final chapter, Dempfle examines the use of the relationship matrix and highlights problems arising from a genetic viewpoint which perhaps both the frequentists and Bayesians are likely to forget. His use of simple examples in this case however is somewhat misleading.

The final section on statistics and new technology begins with a review of methods (Hill and Knott) and a general linkage method (Elston) for the detection of major genes. This is an area where perhaps most advances have been made between the symposium in 1987 and the publication of the book. The final chapter by Kennedy and Schaeffer considers how records of animals, resulting from new reproductive technologies (embryo transfer, sexing, cloning, etc.) can be included in genetic evaluation procedures.

Each section concludes with a summary of the discussion following the oral presentation of the papers. At first sight, these summaries appear superfluous but they can highlight the areas of controversy to the uninformed or can provide entertaining reading as one speculates as to which ‘member of the audience’ raised a particular point.

This book will serve as an excellent reference for many years to animal breeders, quantitative geneticists and statisticians working in this area; a book I am sure they will want on their own bookshelf rather than just in the library. There is a considerable void of advanced textbooks for graduate students in this field and the review chapters of this volume in particular

could provide essential reading material for graduate courses.

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*Genes in Populations*. By ELIOT B. SPIESS, 2nd edn. New York, USA: John Wiley & Sons. 1989. 774 pages. Cloth price £59.00. ISBN 0 471 84973 1.

This textbook deals with conventional population genetics topics, containing both theory and experimental results as well as exercises at the end of the chapters and an extensive statistical and mathematical Appendix.

The dust cover claims that ‘The presentation... is at a level readily accessible to those with a background in basic genetics and mathematics.’ However, beginning students in population genetics are likely to find this text very hard going, as it is difficult to read and long winded. It is much more difficult to follow than Falconer’s highly acclaimed *Introduction to Quantitative Genetics*.

Is this book suitable for graduate students and professionals? It certainly has more the flavour of a comprehensive literature review than a beginning textbook. It provides a fine historical review of population genetics, albeit with a North American bias. References as recent as 1988 are included, but only about 30% are 1980 and later compared to over one-half in Maynard Smith’s *Evolutionary Genetics*.

The scope of population and evolutionary genetics has expanded markedly since the appearance of the first edition, with molecular evolutionary genetics (multigene families, unequal crossing over, gene conversion, transposons, DNA sequence studies, DNA fingerprinting, mitochondrial DNA, etc.), evolution in age structured populations, evolutionary stable strategies, work on prokaryotes, evolution of life, speciation, punctuated equilibrium, etc. assuming a much greater importance. While the dustcover makes much of revision to emphasise developments since the first edition, particularly those in molecular genetics, the flavour of the book reflects the issues current when the first edition was published in 1977. Chapter headings in the two editions are the same, as is much of the text. New developments are predominantly treated as minor additions, rather than as topics of prominence. This contrasts starkly with Maynard Smith’s *Evolutionary Genetics* where much of the text is concerned with consideration of these newer topics.

In a few places the contents of the book are uncritical or misleading, especially in sections dealing with quantitative genetics. The comments on Yoo’s long-term selection studies in *Drosophila* (p. 190) fail to mention that mutations arising in long-term selection lines made significant contributions to genetic variation and selection response in those lines.

The discussion on Locating Polygenes (pp. 216–221) describes the techniques, but fails to point out that the methodology may seriously underestimate the number of polygenes, incorrectly locate them and incorrectly estimate the size of their effects. In discussing loss of genetic variation due to the founder effect (p. 352), the seminal theoretical work of James (1971, *Genetical Research* **16**, 241–250) is not only ignored and credit given to Lande, but the surprising results of Bryant, McCommas and Combs (1986, *Genetics* **114**, 1191–1211) are described without mentioning that four studies obtained results in agreement with simple theoretical predictions. Admittedly, Spiess is not alone in providing an incorrect impression regarding the

founder effect (see Lewin, 1987, *Science* **235**, 1325–1327).

I cannot recommend this textbook as either an undergraduate textbook or as a professional reference book. It is too long-winded and difficult to follow for beginning students and insufficiently modern in coverage to be recommended as a reference book. It does provide a fine historical coverage of the early literature for those who do not already have the first edition.

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