reasons why the question of what is a minimum viable population (MVP) is so difficult to approach. This provides equal measures of pessimism and stimulating food for thought.

Having said this, however, two shortfalls should be noted. First, there is a strong, if understandable, bias towards larger mammals and especially rhinos. Ironically, although rhinos present a highly popular and topical example they have little relevance to the MVP problem. This is because it is unlikely that either the numbers of individuals existing, the reserve space available or the money put towards their cause will approach even the lower estimates of what is required. In contrast, animals such as fish, rodents and insects which have less public appeal but are much more amenable to empirical study by population manipulation are barely mentioned. The second shortfall is the paucity of biogeographical data that is reviewed. The study of island populations is one of the very few ways in which species longevity in restricted habitats can be approached, yet such information is largely ignored.

As someone who does not delight in sub-scripted summations in n dimensions I find it unfortunate that the space left by these omissions has been filled by quite so much mathematical modelling. It is a general rule that the simpler equations say nothing that can't be said better with words and that once they grow large enough to say something interesting all they stimulate is frenzied page-turning or slumber. Soulé himself questions their use and any heroic reader who manages to follow them through to the end should be extremely careful not to get lulled into a false sense of security by their numerical solutions. At present we know very little about any of the parameters that support these models, nor the extent to which simplifying assumptions modify their results, thus the numbers they spew out hardly even justify the term 'ballpark'. Indeed, it takes no great biologist to realise that a viable population of rhinos is going to be between 100 and 10,000. Such a level of accuracy is little worse than that of many models. This unfounded confidence in numbers is no better illustrated than in the ultra-sophisticated "decision tree" (p. 148). Instead of making one educated guess at a parameter, it is broken down into many constituent parts. Guessed probabilities are assigned to each of the parts, a little multiplication performed and hey presto, a number, accurate to two decimal places, is conjured up. Such methods may help to visualise a problem but do not, as claimed, signify any great leap forward in our understanding of population management.

In conclusion, this book is a useful guide to one of population biology's more difficult problems and does well to fill a clear hole in the market. It does not provide any hard and fast rules for calculating what is a viable population, and should not be looked upon to do so. What it does do is to cover a wide range of potential parameters affecting mammalian population viability and to demonstrate for each how far present knowledge extends. Without being exhaustive it does this competently and is at the same time very readable. It must be seen, therefore, as a useful contribution to the bookshelves of students, practical conservationists and academics alike.

BILL AMOS
Department of Genetics
Cambridge University

Essential genetics (2nd edition). Peter J. Russell. Blackwell Scientific Publications, Oxford. 1987. Pp. ix + 493. Price £13.50 ISBN 0 632 01602 7.

This is yet another example of the "DNA to Dinosaurs" genre of first year Genetics text. In general, I preferred the more elegant and intellectually demanding, history of experiment approach, as exemplified by Whitehouse ("Towards an Understanding of the Mechanism of Heredity"). However, recent trends in textbook writing do not favour this and we may well be stuck with unfolding the molecular truth in increasing complexity for some time. Whether we have to be stuck with Russell is another question.

This book is at its best, uneven in coverage, inaccurate in detail, and confusing in presentation. At its worst, it plumbs depths of ignorance and incoherence which I have not seen between soft covers since the publication of "Genetic Fix".

The first twelve chapters, which cover what might loosely be called Molecular Biology, are marked by glib generalisations and summaries. For instance, the account of *E. coli* polymerase activity; "this exonuclease activity functions like a correcting typewriter so that incorrectly paired bases are deleted and excised", page 49. How? By magic, the despairing student might conclude. In the most old fashioned way, mitosis and meiosis are dealt with sequentially and descriptively. Four lines are devoted to telling the student that "behavior of chromosomes in the meiotic division is directly relevant to the segregation of genes and this relationship will be developed in detail in later chapters". This not withstanding that educational research has show again and again that students are unnecessarily confused by the joint presentation of meiosis and mitosis. A geneticist's interest in meiosis is precisely because of its implications for segregation and this should be the basis of the presentation of that process in any textbook. Further on proponents of creationism will be relieved to find that the chapter entitled "Mutation, mutagenesis and selection" (page 78) does not include any account of natural selection (evolution is barely mentioned in this book) but instead selection of specific mutants is meant.

When faced with the second half of the book, covering classical transmission genetics, the author's lack of familarity with the field is further exposed. He thinks that most genetic variants are recessive (page 238) and

that dominance is a property of alleles (pages 239 and 242). His treatment of quantitative genetics is absurd and derisory—it occupies a little under one page! The chapter on linkage and recombination is one of the most fussy and confusing that I have read. But worse is to come. His treatment of human genetics is spangled with further errors. His reasons for the maternal age dependence of the incidence of Down's Syndrome are incompatible with the known frequency of paternally derived extra chromosomes in the syndrome. He includes erroneous material about the 45XO karyotype associated with Turner's Syndrome and the XXY karyotype associated with Klinefelter's Syndrome (patients' self-help groups may begin to think about sueing authors who perpetuate damaging myths). Nothing is said about immunogenetics, multifactorial inheritance etc., etc. Human genetics seems to consists of aberrations for Russell—and although disproportionate space is devoted to human cytogenetics, normal non-pathological variation in karyotype is nowhere mentioned.

The "pièce de résistance" is his Chapter 21 on Population Genetics. Again it is confusing; p and q may not take any values; they always add up to one! (page 409). Hardy-Weinberg has long been known to be a most inappropriate tool for making predictions about natural populations. His demonstrated use of it are illegitimate. Incorrect answers to questions, such as 21.14, display his lack of understanding of even the basic principles of population genetics.

Where are the models of selection, where are the accounts of evolutionary theory, where is the treatment of genetic variation and where is the treatment of genotype/environment interaction? This is a thoroughly rotten book and Blackwells, let alone the author, should not have foisted it on us.

DR J. A. STEWART
Department of Genetics
Leeds University