I learned something about Haldane and about the world every time I opened this book. You will too.

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The Genetic Basis of Plant Physiological Processes. By JOHN KING. Oxford University Press. 1991. 413 pages. Price £40.00. ISBN 0 19 504857 1.

Why is it almost impossible to find a microbiology textbook which does not mention the use of mutants to dissect physiological phenomena, yet almost equally impossible to find a plant physiology text which does? In the preface to *The Genetic Basis of Plant Physiological Processes*, John King suggests that part of the reason may be that plant physiologists are unaware of the potential of genetic analysis, and he attempts to put this right by bringing together a vast number of examples where the use of mutants and genetic variants has contributed to an understanding of plant behaviour.

The book contains six chapters, dealing with a variety of processes from photosynthesis to hormone metabolism and development. Each consists of several case studies, in which large amounts of relevant data are presented and discussed concisely, but without areas of controversy being glossed over. It is therefore easily read and also a good source of reference. Although the author states that his objective is not to provide a complete account of plant physiological genetics, the coverage is broad, and shows a consistency which would not be found in a collection of reviews with the same scope. The brief introductions to each case study would in themselves make a useful physiology textbook.

I have one major criticism of the book. As a member of a generation which regards genetics as part of an analytical process which also includes gene isolation, and all the techniques that this makes possible, I found the impact which molecular genetics has already had on the subject neglected. Conversely, in addressing itself to a dying breed of pure physiologists, the book also understates the importance physiological genetics should have for molecular biology. As one example, it says little about how genes with a regulatory role, or which encode rate-limiting enzymes, might be identified genetically. This kind of information would be important for anyone wishing to manipulate a physiological or biochemical process by the introduction of transgenes. As it stands, the book appears to mark the end of a period of research, and not to herald the beginning of a new one. Perhaps this will make it an enduring classic.

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Catalog of Prenatally Diagnosed Conditions (second edition). By DAVID D. WEAVER. Johns Hopkins University Press. 1992. 415 pages. $75.00. ISBN 0 8018 4415 0

Classification of medical disorders has always been a key to diagnosis, management and treatment. Amongst genetic and partly genetic diseases, where individual rarity and extreme heterogeneity are the rule, sorting out, ordering and naming the syndromes has been of immense importance in all subsequent studies of the cellular and molecular basis of the underlying pathology. The 'bible' for medical geneticists is Victor McKusick's *Mendelian Inheritance in Man*, now in its 10th edition, and an essential handbook of both normal and pathological variation where there is evidence for single locus control. Most genetic disorders can now be assigned an MIM number based on McKusick's classification.

The explosive growth in the science and technology of prenatal diagnosis has presented both clinical geneticists and obstetricians with a real problem in keeping abreast of their discipline. Can a particular condition be diagnosed *in utero*, and if so, how and with what degree of certainty? This question is frequently addressed to the genetic counsellor with a degree of urgency; indeed, it has to be said that there are occasions when it is asked with the patient already prepared for amniocentesis or chorionic villous biopsy. There is a crying need for an instant reference book, which will provide the initial answer to the question posed as well as a set of references to the relevant medical literature.

The first edition of David Weaver's book (1989) was an attempt to offer a comprehensive listing of disorders where prenatal diagnosis had been reported in the journals. He recorded 445 conditions and 1221 references. In the second edition there are 601 conditions, while the reference list has grown to 1848 citations. More importantly the text has been considerably enlarged, so that there is now reasonable comment on most disorders covered.

The catalogue is organized into major chapters on the big three of prenatal diagnosis – chromosome anomalies, congenital malformations and Mendelian conditions – with lesser sections on dermatological disorders, fetal infections, tumours and cysts, and others. Each condition is assigned a 'PD' number, though the rationale for these numbers is not made clear. It could be argued that matching PD and MIM numbers would have been helpful, particularly as McKusick's MIM system immediately indicates the mode of inheritance of the disorder. However, since a large majority of prenatally diagnosable conditions are not simply inherited, this would have been difficult though not impossible to achieve.

I have little doubt that Weaver's catalogue will find its place next to McKusick on the shelves in all modern medical genetic centres. It really is an invaluable reference book. It is pleasing to note that

the database is now available by modem, though I suspect that plans to update this on a yearly basis will not keep pace with the accelerating progress in this vital branch of medical endeavour.

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Molecular Genetic Analysis of Populations. A Practical Approach. Edited by A. R. HOELZEL. IRL Press at Oxford University Press. 1992. 315 pages. Price £22.50. ISBN 0 19 963277 4

Molecular Genetic Ecology: In Focus. By A. R. HOELZEL and G. A. DOVER. IRL Press at Oxford University Press. 1991. 75 pages. Price £6.50. ISBN 0 19 963265 0

Such is the current interest in studies of populations which make use of molecular data that books summarizing techniques and results are to be expected, if not welcomed. Population biologists who wish to make a sortie into the world of molecular biology but who are uncertain of quite where to turn for advice have much to gain from any literary proliferation. The essential requirements for such people are a knowledge of which data are the most informative for the particular question posed, how to obtain that data, and then how to interpret it in a biologically meaningful manner.

Molecular Genetic Analysis of Populations provides a manual of laboratory protocols by which researchers may obtain the necessary molecular data. A variety of experimental techniques are described, including the starch gel electrophoresis of allozymes, the isolation and visualization of different DNAs (although emphasis is given to that obtained from animal mitochondria), and the analysis of these DNAs through the use of RFLPs, PCR amplification and sequencing and DNA fingerprinting, as well as the development of genomic libraries and species-specific probes. The protocols themselves are generally clear, and maintain the high standards set by previous members of the IRL Press *Practical Approach* series. The surrounding text, written by those well qualified to do so, provides some interesting discussions on the relative worth of different approaches to obtaining data and useful labour-saving tips, as well as some of the difficulties inherent in work of this kind.

Although a few minor criticisms might be raised concerning the organization of some of the chapters, the protocols pertaining to the isolation and visualization of mtDNA, for example, are presented in different chapters where perhaps one larger and more complete chapter would have been more satisfactory. However, for those who have a clear idea of what data they wish to obtain, *Molecular Genetic Analysis of Populations* is to be recommended in that it provides, in a single volume, a clear description of experimental techniques for those interested in the biology of populations.

But what of those uncertain of which data they require? If there are to be criticisms of this book they are more to do with what is absent rather than with what is present. Although some of the chapters and particularly those concerning the use of allozymes and DNA fingerprinting are more comprehensive in their approach, the book is weak on advice concerning the choice and analysis of data. A far more complete presentation would be had if there was a section guiding the uninitiated into an understanding of *which* molecular techniques provide *what* information in relation to *which* question; as one of the contributors (Bernie May) puts it, 'we must examine the kind of question being addressed and decide what type of data will answer sufficiently and efficiently the question'.

Greater difficulties arise with the attempt to describe statistical (population-genetic) methodologies by which we may understand the full biological implications of a data set. What makes the needs of population biologists different from the multitude making use of the techniques of molecular biology is not so much the techniques themselves, which are often applicable to many related fields, but the nature of the data itself; that it is representative of populations and that it can be interpreted in ways pertinent to the great questions of ecology and evolution. The statistical analysis of molecular sequence data is therefore as much a topic of interest as the laboratory methods by which such data is generated, if not more so.

To be fair, the Appendix provided to cover the statistical interpretation of molecular data is only meant to serve as an introduction to what is in reality a complex subject. However, despite these mitigating circumstances, the blank description of formulae supplied does not give the hopeful reader much sense of the important biological and statistical issues involved in their derivation. A fuller chapter outlining more of the background (and references) to the relevant formulae would surely be more informative, and do justice to the rest of what is generally a thoroughly decent book.

Proof of the fact that molecular data can be interpreted in different ways is provided by *Molecular Genetic Ecology: In Focus.* This small pamphlet-like book is basically intended to give students an introduction into how molecular techniques have been used to provide more precise measures of genetic variation in populations, and what such variation means.

The first of the book's four sections describes the nature of the molecular data and the evolutionary mechanisms which produce it. We are then shown some of the laboratory techniques used to generate this data, and a third section attempts to give some population genetic–molecular evolutionary background. Finally, some examples taken from the