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Book reviews

***Aspergillus*: 50 Years On**. Progress in Industrial Microbiology (Vol. 29). S. D. Martinelli and J. R. Kinghorn. Elsevier, Amsterdam. 1994. Pp. 880. Price £210.00, hardback. ISBN 0 444 81762 X.

As one of the few *Aspergillus* workers in the UK without a chapter in this book (doubtless why I was asked to review it!), I am presented with a unique opportunity for either offending or endearing myself to a large proportion of my co-workers and associates. Therefore, it is with some relief that I feel able to congratulate the editors on successfully completing a mammoth task.

The book brings together a host of distinguished authors in a celebration of 50 years of research using *Aspergillus nidulans* as an experimental organism. The sheer size of the book (880 pages) reflects the volume of research that has been undertaken in this field since its humble beginnings at the University of Glasgow in the 1940s. It is a timely publication, arriving during a period of increasing interest in *Aspergillus* species, both as model systems in the laboratory and as tools for the biotechnology industry.

Fittingly, the book opens with a foreword by the recognized founding father of *A. nidulans* genetics, Guido Pontecorvo, and then proceeds into an introductory section which aims to acquaint the reader with both the organism and authors. Although the latter borders on self-indulgence, it was, for a relative newcomer to the field, an amusing account which conveys vividly the atmosphere in the Glasgow laboratories during the early days of *Aspergillus* research. The remainder of the book is divided into a further seven sections, with a total of 28 chapters and four appendices. Topics covered include metabolism, gene regulation, cell cycle and development, molecular tools, applied aspects and a useful final section containing details of media, gene designations *etcetera*.

The general level of presentation is high. Most of the chapters are clearly and concisely written, with good-quality graphical and photographic images and an extensive reference list. The degree of success of a book like this depends not only upon the quality of the individual contributions, but also upon the choice of contributors and their specialities. On the whole, the choice is well-balanced and is a fair reflection of the current state of play in *Aspergillus* research.

The book is certainly a comprehensive treatise of the subject and contains a wealth of core information. Inevitably, it suffers from a defect typical of books of this nature; namely, it has been rather too long in gestation, the most recent references being 1993. Indeed, at least one of the chapters has been published elsewhere (in modified form) in the meantime! Although this does not detract from the general usefulness of the book, the committed reader would have to consult more recent papers in order to be entirely abreast with the current knowledge.

This is a mighty tome with a price to match (£210). In these times of economic constraint, it is unfortunate that the high price will put the book well beyond the reach of postgraduate students (who would find it invaluable) and will probably stretch the budgets of most researchers in HE institutes.

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Methods in Gene Technology (Vol. 2). Jeremy W. Dale and Peter G. Sanders (eds). JAI Press, Middlesex. 1994. Pp. 354. Price £62.50, hardback. ISBN 1 55938 264 3.

This book contains 19 chapters of which 8 cover DNA preparation and purification, 1 RNA preparation, 1 sequencing, 3 pulsed field gel electrophoresis and 1 single stranded conformational polymorphism analysis. The remaining chapters cover topics such as analysis of DNA supercoiling and south-western blotting. Several of the chapters contain very basic instructions, for example 'Don't forget the buffer!' in Chapter 2.

My impression is that about one half of this book is devoted to DNA preparation and purification and much of the material is familiar and can be readily found elsewhere. Obviously, as DNA is the starting material for many experiments involving molecular biology, it is very important to know how, when and why different techniques may provide appropriate DNA. Other chapters also cover familiar topics, for example 'Detection of Mutations by PCR-Single Strand Conformation Polymorphism'. Again, this chapter may prove useful to some but could have been of more value if presented in conjunction with other chapters detailing the practical details for other methods used to identify mutations with perhaps comments on their relative advantages and disadvantages.

The main question to be asked is whether this book would be used by individuals at the bench, in research and diagnostic laboratories. The answer is probably not, although I admit that the book is perhaps not specifically aimed at human genetics laboratories.

Certain chapters, such as that by Drlica *et al* on 'Analysis of DNA Supercoiling', that by Goping *et al* on 'Gel retardation assays and DNA footprinting' and that by Primal *et al* on 'Genome fingerprinting using the PCR-Random amplified polymorphic DNA technique' are

however useful and contain technical details which are not commonly available elsewhere. The chapter by John Maule (Preparative Gel Electrophoresis) was also good in this respect.

One of the very best features of this book is the inclusion of technical notes and troubleshooting guides in many chapters. Troubleshooting is a neglected area of methodology and nothing is more frustrating than a method which for no apparent reason does not work. These sections seem to be particularly well constructed and written and are likely to be very helpful for those who are attempting to use techniques with which they are unfamiliar and for which there is little in the way of advice from colleagues with practical experience. As such, many of these chapters will be very useful as sources of reference for students beginning basic molecular biology courses, since they provide clear explanations for the basis of the techniques.

This book will probably be bought by libraries but I suspect, like many other methods books, not much consulted. Those who do read the book and who have specific needs for techniques which are addressed, are likely to find many chapters very informative.

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Non-Neutral Evolution: Theories and Molecular Data. Brian Golding (ed.). Chapman and Hall, London. 1994. Pp. 249. Price £29.95, paperback. ISBN 0 412 05391 8.

A lot of time and soul searching must have gone into the title of a volume which defines itself in terms of what it is not, rather than what it is. The phrase 'Non-Neutral Evolution' tacitly acknowledges that the Neutral Theory of Molecular Evolution has frustrated virtually all attempts to pin the observed patterns of molecular variation to adaptive models of evolution. The title, more than anything, illustrates just how much things have changed in the last ten years.

This volume is the result of a recent workshop, sponsored by the Canadian Institute for Advanced Research, which brought together some of the World's most respected evolutionary biologists to assess the state of play. As such it provides an accurate cross-section of current research, ranging from largely descriptive empirical work to purely theoretical contributions. My most basic criticism is that the interaction of theory and experimentation is rarely shown to bear fresh fruit. However, this is perhaps understandable in a field which openly laments the fact that it provides 'fodder for the theoretician, but little solace for the experimentalist' (Chapter 1).

Despite this reservation there is evidence that the deluge of DNA sequence data is providing new ways of looking at old problems. One of the clearest predictions of the Neutral Theory, the existence of a quantitative relationship between levels of DNA sequence variation within and between species (they are both products of the same combination of mutation and drift), is challenged repeatedly here using data from *Drosophila* species. The conclusions are firm; the null hypothesis of the Neutral Theory can be rejected, some sequence variation clearly isn't strictly neutral. Unfortunately, as several authors go to some length to point out, this doesn't necessarily mean it's adaptive either.

An instructive example comes from an excellent series of chapters on the relationship between recombination, variation and selection. Regions of reduced meiotic recombination exhibit low levels of intraspecific variation, but interspecific levels of variation are normal. This has been cited as clear evidence for the presence of linked loci under positive directional selection. However, the observed levels of within- and between-species variation can be explained equally well by selection against linked deleterious loci being maintained by mutation. While the theoreticians are busying themselves trying to find conditions under which the competing explanations can be discriminated we can conclude one thing for certain; empirical proof of natural selection and confirmation of Darwinian evolution remains as elusive as ever at the molecular level.

There is some clear, informative writing here, particularly where a relatively well-defined problem or small body of work can be covered comprehensively. There is also a healthy mix of novel and established work which broadens its appeal. Ultimately, however, the volume is disappointing simply because of the intractability of the subject matter. So many chapters detail the pattern of sequence variation at so many loci in so many species and in so many different ways, yet come up with so few firm conclusions. I suppose that's just the way it's always going to be when you take snap-shots of molecular variation and try to extrapolate the pictures across the millenia.

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Nucleic Acids and Molecular Biology (Vol. 8). Fritz Eckstein and David M. J. Lilley (eds). Springer-Verlag, Berlin. 1994. Pp. 330. Price £110.75, hardback. ISBN 3 540 57485 9.

The title *Nucleic Acids and Molecular Biology* is one which could be interpreted to include an enormous range of topics. However, the coupling of the two terms leads us to expect structural aspects of DNA and RNA and their interactions with proteins and drugs. This is in fact more