

amount of historical background, a description of the technique and a troubleshooting section. Each chapter closes with reference lists which are pretty much up-to-date with several 1995 titles. This style was both easy to read and follow — exactly what one requires from a manual of this nature.

The first chapter covers basic molecular biology. As an experienced molecular biologist I found it helpful to have all the basic material contained within this initial chapter to prevent repetition later. Indeed researchers new to this area may also find it helpful to have the majority of the basic material within one place. It certainly saves having to move from one section to another. The editor stated that the manual is targeted 'towards a wide range of people with different levels of experience', and this aim is, in the main, fulfilled. However, when the manual was shown to a colleague with little knowledge of this area he did comment that texts like this could never be basic enough for his liking.

At the beginning of the second chapter I became a little worried as the schematic diagram of a PCR reaction in no way aided the understanding of the text. However, this concern was short-lived as the 'use of PCRs in Plant Molecular Biology' section rapidly became a mine of information within this area. It was nice to see the authors suggest suitable computer software that could be used to design PCR primers. In addition various helpful hints and useful tables (e.g. the nucleotide sequences of PCR primers for the various plant marker genes on page 70) were liberally scattered throughout the text. This information can be easily obtained elsewhere but it is nice to see it brought together within one text.

On to Chapter 3 — if there was something that spoilt this manual then it was here. Once you start to spot typographical errors of the nature exemplified on pages 195–196 you begin to get that worrying feeling of just how many others are present that you might not be spotting. Spelling Whatman incorrectly at first (as Whatmann) on page 195 was corrected by the very next page. However, on the same page I was intrigued as to exactly how you are expected to use 1.5 microfuge tubes! These errors may seem amusing but they ought to have been spotted at the proof reading stage. These particular errors are unlikely seriously to affect an experiment but there remain nagging doubts that if these errors had crept through then how many others persisted, for example in the volumes or concentrations stated within the methods sections. However, these errors notwithstanding, many of the sections were excellent, both informative and up-to-date. This is best demonstrated by there being a section on the relatively new technique of cloning differentially expressed cDNAs by using Differential-Display Reverse Transcriptase Polymerase Chain Reaction (DDRT-PCR).

Overall, this manual deserves to be highly recommended due, in particular, to the clarity of the writing. It joins the market place (at a reasonable price of £42) where the only significant opposition comes from one other manual. I am sure that this manual will be

purchased and used by many in this rapidly expanding area of research.

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Gene Cloning and Analysis — Current Innovations. Brian C. Schaefer (ed.). Horizon Scientific Press, Wymondham. 1997. Pp. 214. Price £34.99, paperback. ISBN 1 898486 06 9.

The major theme of this book is refinements to existing technologies and recently innovated technologies for the isolation and partial characterization of genes. The topics are particularly pertinent to the functional analysis phase of the human genome project given the identification of large numbers of cDNAs via Expressed Sequence Tag studies. A restriction endonuclease-based differential display approach for identifying cDNAs of interest is detailed in chapter 3, whilst the isolation of full length cDNAs is described by chapters 6 and 7. Elsewhere is considered the characterization of cDNA-encoded proteins on the basis of protein-protein/ligand interaction (chapters 1 and 2), codon mutagenesis to study the relationship between protein structure and function (chapter 8), and the alteration of protein function by gene replacement (chapter 10).

The remainder of the articles is loosely divided into techniques of perhaps particular relevance to diagnostics, and procedures that are applicable to molecular biologists working in a spectrum of fields. Peptide nucleic acid-based purification techniques (chapter 4) are suited to the sequence-specific purification of DNA templates from clinical material, whilst PCR-SSCP analysis (chapter 13) remains a valuable tool for the detection of sequence variation in DNA samples. Of universal interest, are TA cloning (chapter 11), a PCR-based method for isolating genomic DNA flanking a known sequence (chapter 5), and a method combining restriction digestion with 'long PCR' to effect selective amplification of one of a group of homologous sequences (chapter 12).

Volumes of this genre are normally a joy for the bench scientist because they elaborate on the nuances of experimental procedures and fill in the unwritten gaps so often present in scientific papers (indeed, there are few things more satisfying than being able properly to apply something that one has read to good effect in a short period of time). With few exceptions, this book fulfils the role of a good laboratory companion. Furthermore, the information is often usefully presented in combination with a review of variants of the procedure discussed. Chapter format is consistent throughout; a review of alternative approaches to a given technology is followed by a description of a specific procedure, preceding a section on trou-

bleshooting and useful tips. The level of knowledge required for effective use varies from chapter to chapter; in the case of the more involved chapters, the protocols are not as complete as in roughly equivalent texts, and referral to other references is required. For this reason the book is probably best targeted at the reasonably well informed. However, in essence the book is well compiled and a jolly good read for the practising molecular biologist.

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Natural Selection and Patrick Matthew. Evolutionary Concepts in the Nineteenth Century. W. J. Dempster. The Pentland Press, Edinburgh. 1996. Pp.365. Price £12.50, paperback. ISBN 1 85821 356 8.

There are so many things wrong with this book that one could easily overlook what an indispensable contribution it makes to the literature. After Darwin published *On the Origin of Species* in 1859, a Scottish horticulturalist, Patrick Matthew, was the most plausible claimant to insist he had published a theory of evolution by natural selection long before. He did not accuse Darwin of plagiarism, but he did want recognition, and that Darwin duly gave him. Matthew's exposition was in a few pages of an appendix to a book of 1831: *Naval Timber and Aboriculture*; so Darwin did not feel too badly about having missed it.

Traditionally historians have been content to mention Matthew, to note how marginal he was to mainstream, prestigious science and to emphasise the obscurity of his text, although it was published by well-known houses in both Edinburgh and London. When they have dwelled on his theorizing they have tended to agree that, yes, a concept very much the same as Darwin's, a concept of natural selection, is indeed there, albeit rather sketchily articulated; but that it was coupled with a catastrophist geology strongly contrasting with the uniformitarianism Darwin has learned from Lyell. More recently, following an indispensable article of 1973 by Kentwood Wells, in the *Journal of the History of Biology*, historians have looked at Matthew's life and work as a whole and made

connections, especially, between his views on the origins of species and his views on emigration and colonies. These connections have very broad significance, for they are matched in Darwin's thinking too. So, if one was standing back and asking how the theory of natural selection related to the ideology and practice of British capitalism, one might do well to concentrate more on capitalism as manifested in empire and less on capitalism as manifested in manufacturing industry.

It is a virtue of Dempster's book that it actively pursues such issues, and so advances our understanding not merely of Matthew himself but also of the integration at that time of social and biological concepts. Very useful too are Dempster's accounts of selection as a technique deployed by nineteenth-century animal and plant breeders, of Edward Blyth's study of variation in animals, and of Matthew's review of Darwin's *Descent of Man*. What, then, is wrong with this book? It would be churlish to draw up an exhaustive inventory. But readers should be warned that it is full of inaccuracies, great and small, that it is often grossly anachronistic in its interpretation, that it indulges in a chippy Scottish chauvinism that must only irritate admirers of Scottish scientific culture, and that the prose abounds with all kinds of flaws, many serious enough to render arguments and assertions incoherent or obscure.

One would be curious to know more about the history of Dempster's own book. The first edition appeared in 1983, and he explains that he has been encouraged to produce an expanded version by the trustees of the Patrick Matthew Trust whose funds covered the costs of production. Matthew, it seems, is not just a historical figure but has become once again a current cause and a living presence. Dempster writes as a partisan. Constantly complaining that scientists have never given Matthew his due, he is himself consistently ungenerous and carping about what other historians have written about his hero. But this is a familiar price to pay for learning about a minor player from the past; often only those with axes to grind will take up such a topic at all. In this case the price is well worth it.

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