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# Book reviews

**Molecular Evolution — A Phylogenetic Approach.** Roderic D. M. Page and Edward C. Holmes. Blackwell Science, Oxford. 1998. Pp. 346. Price £24.95, paperback. ISBN 0 86542 889 1.

The authors set themselves the tasks of showing how evolutionary information is written into gene sequences and describing the methods by which such information can be recovered. In this quite excellent book they succeed, providing a wealth of examples and setting many of them in a historical perspective.

There are eight chapters, the first three of which provide an introduction to molecular evolution, phylogenetic tree reconstruction, and the evolution of genes and genomes. Chapter 4 introduces the subject of population genetics and describes how gene genealogies can provide insights into the evolutionary history of populations and speciation events. Chapters 5 and 6 provide a more in-depth discussion of the methods by which evolutionary distances are inferred, the construction of phylogenetic trees, and the advantages and disadvantages of the various techniques in use at the present time. Chapter 7 uses the neutralist–selectionist debate to discuss many other themes in molecular evolution, such as molecular clocks, codon usage and functional constraint. Finally, the last chapter describes the implications and uses of phylogenetic reconstruction for evolutionary biology in general, demonstrating how such analyses can reveal much about the evolution of gene families, host–parasite cospeciation, epidemiology and speciation and extinction rates. I found this chapter particularly informative as it gives a clear impression of how the modern uses of phylogenetic reconstruction have expanded from their original application of examining the relationships between species using gene trees. It would, however, have been interesting to have seen some discussion of how the authors think the field will evolve in the future.

Each of the above chapters contains a summary, numerous worked examples, and a further reading list. Various terms and techniques are further explored in separate sections of boxed text and these make it easy for the reader to follow the flow of the main text. Indeed its readability is one of the best aspects of the book and as such it will provide an excellent introduction to the subject of molecular evolution for both undergraduates and research students. I also think it will be useful for other researchers, particularly molecular biologists, who either want to gain an impression of how their data can be used in an evolutionary context, or who actually want to move into the field of molecular evolution. Having been in this position myself I know how difficult it can be to take this initial step if there is no one to give day-to-day advice. In this regard it is a pity that the book does not provide more information on how to obtain the actual programs used by the authors in their worked examples: a section or appendix providing web-site addresses and ordering information would have be a most useful addition.

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**The Genetics of Cattle.** R. Fries and A. Ruvinsky (eds). CAB International, Wallingford. 1999. Pp. 710. Price £99.50, hardback. ISBN 0 85199 258 7.

Dr Ruvinsky has set himself a somewhat Herculean task in producing a monograph on the genetics of each major domestic animal species. The Sheep (1997) and the Pig (1998) are already out and Cattle forms the third in the series with the Horse and the Dog to follow. In each case a different co-editor has been found and authors stem from Australia, Europe and North America.

Produced by some 35 authors, the 24 chapters in the present volume each represent an important review on its subject. As a comprehensive text the coverage relates not only to features that have seemed relatively minor issues to animal breeders, such as coat colour, blood groups and inherited anomalies, but also includes such interesting and crucial areas as disease resistance, behaviour and reproduction. There is a chapter on the 'Genetics of Meat Quality' but no corresponding one on milk, although a chapter on 'Molecular Genetics of Milk' does exist and some of the genetic parameters of milk production appear in the chapter on 'Genetic Improvement of Dairy Cattle'. In a book that is intended as a reference tome it could be argued that the order of chapters is less relevant but there is some lack of logic in the order followed, which was better in the Sheep book. For example, however redundant one may consider breeds in the modern era, the logical place for a breed chapter was after the 'Genetics of Domestication' (Ch. 2), not as the last chapter of the book. Similarly, the 'Genetics of Meat Production' appears after the 'Genetic Improvement of Beef Cattle'. One would expect to look at genetic parameters before discussing their advancement. In contrast 'The Genetics and Biology of Reproduction' appears, rightly, before 'Reproductive Technologies'.

As might be anticipated the book has a great deal (too much?) on molecular genetics, gene mapping and cytogenetics but there are more down-to-earth chapters on 'Conservation' and the 'Adaptation of Cattle to the Tropics'. In keeping with the previous books in this mammoth series each chapter brings with it several pages of references covering the past 30 years or so. This makes each chapter a self-contained treatise on its