

Book reviews

The Genetics of the Horse. A. T. Bowling and A. Ruvinsky (eds). CABI Publishing, Wallingford. 2000. Pp. 527. Price £85.00, hardback. ISBN 0 85199 429 6.

This book is an excellent, well researched and comprehensive reference work for all areas of equine genetic. It covers topics from phylogeny to the measure of performance traits and will be a useful source of information for years to come. It is written in a style that is straight forward, easy to read and never superfluous. The layout of each chapter is very clear and the chapters are organized well in relation to each other according to subject area. The list of references at the end of each chapter is very thorough. In the early chapters, photographs of the various examples of the *Equus* subgenera and the not so familiar horse breeds, such as the 'Yakut', would have been a welcome addition to the written descriptions, which tend to be tedious at the best of times. In addition, a picture of the skeleton and musculature of the horse at the beginning would have been helpful in those chapters that include descriptions of research on particular muscle areas, etc. The chapter on 'Genetic Resources and their Conservation' was particularly relevant, as breeders often do not consider the implications of their present breeding goals in the context of their use of only a few selected families in the production of sport horses. Perhaps this should have been the concluding chapter, as it summarizes the types of constraints and challenges that are facing horse breeders world-wide.

As a teacher, I feel that this is not necessarily a book for undergraduates because some of the material requires a good knowledge of genetics in order to understand particular chapters, for example those covering the topics on 'Immunogenetics', 'Cytogenetics' and 'Physical Gene Maps'. Most importantly, this book highlights the wealth of research that has been carried out in equines and also emphasizes the research that still needs to be done, for example in the chapter entitled the 'Genetics of Conformation, Locomotion and Physiological Traits', where the importance of conformation on breeding selection is discussed. The glossary is a very thoughtful and useful addition, especially for those who are not directly involved in horses. However, the index is disappointingly short and at 11 pages really needed to be increased in size.

In conclusion, this is a book that covers all relevant areas of equine genetics in a useful and comprehensive manner and it is one that any person involved in teaching, research or development within the horse industry should have on their bookshelf.

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Evolution — An Introduction. Stephen C. Stearns and Rolf F. Hoekstra. Oxford University Press, Oxford. 2000. Pp. 381. Price £18.99, paperback. ISBN 0 19 854968 7.

Evolution is a challenging subject to teach. It is a central concept in biology, so the topical coverage of an introduction to evolution is potentially very broad in scope. Evolution is sometimes perceived as controversial, when in fact the scientific basis for evolution is strongly established. Finally, many perceive evolution as primarily historical in perspective.

This new textbook by Stearns and Hoekstra addresses these challenges quite nicely. It provides a readable account of selected topics, in both contemporary evolutionary ecology as well as a broad overview of long-term evolutionary history. The authors deliberately limited themselves to current issues rather than trying to produce a complete catalogue of evolutionary biology, and the result is a book that provides reasonable coverage but that is still sufficiently limited in scope for a semester-long course on evolution.

The book starts out with several chapters addressing various aspects of microevolution. The chapters that address evolutionary ecology, such as expression of variation, evolution of sex, evolution of life histories and sex ratios, and sexual selection, make effective use of selected contemporary biological examples to illustrate the concepts being presented. The succeeding chapters on systematics and historical processes in evolution are very clear and build nicely on concepts presented earlier. The discussion of long-term evolution concludes with discussion of aspects of evolutionary biology that are currently advancing at a rapid pace, such as the evolution of development across all organisms and the understanding of human diversity.

The book does not provide as much of an overview of classical examples as some of the other evolution textbooks currently available, and there is no presentation of the historical development of evolutionary biology as a scientific field. This was apparently done deliberately to convey evolution as a contemporary and dynamic field. Thus, it is what the title claims – an introduction to evolution that complements existing textbooks more suitable for an advanced level.

The tone of the book is conversational and accessible. Concepts that could get bogged down in theory are explained on a level that could be grasped by students with diverse backgrounds. The book draws primarily on examples from recent research publications, lending a sense of contemporary momentum to its presentation of evolutionary biology. Overall, this book represents a reasonable alternative to

other textbooks presently available, particularly at the introductory undergraduate level.

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A Primer of Population Genetics (3rd edn). Daniel L. Hartl. Sinauer Associates, Inc., Sunderland, MA. 2000. Pp. 221. Price £21.95, paperback. ISBN 0 87893 304 2.

The development of mathematical genetics in the first quarter of the twentieth century proved a triumph of reason over invective, effectively uniting Darwin's arguments with Mendel's observations. It provided a powerful heuristic for evolutionary biology and set the stage for the New Synthesis, while generating the foundations of modern population and quantitative genetics (see Provine, 1971 – happily for us and our students, University of Chicago Press plans to re-issue this out-of-print classic). At the beginning of this slim volume, Hartl argues – I believe correctly – that the advances of molecular biology, by allowing virtually all genetic variation to be visualized (rather than the previously accessible small subset), draws population genetics even closer to the centre of biology, gives it abundant empirical grist, and makes it more important than ever.

Hartl's 'big' book (Hartl & Clark, 1997) has been a popular, complete introduction to the field, with the previous versions of this *Primer* as a condensed but not diluted complement. This new edition continues to fill the valuable role of a quick immersion. Its lively style, good graphics, real examples and largely error-free production will make it valuable not only to students but to professionals in other areas of biology (molecular genetics, ecology, systematics, epidemiology, conservation biology, etc.) willing to be convinced of what modern

population genetics, broadly construed, has to offer their disciplines.

The book is divided into four chapters of about 50 pages each, which prove to be logical and stimulating foci for such a précis. Chapter 1 introduces genetic variation in populations with a clear summary of molecular techniques, leading on to a standard development of random mating, linkage disequilibrium and inbreeding. Chapter 2 is a short course in how genetic variation within and among populations changes through time, i.e. of evolution, and touches on advanced topics such as hierarchical population structure and diffusion approximations to random genetic drift. Chapter 3 leads through some newer territory. It shows some of the ways that population geneticists, including Hartl, have advanced theory to capitalize on details of genetic variation revealed by molecular biology, with the goal of inferring evolutionary history of genes and species and the relative roles of different evolutionary factors. Chapter 4 is a nice summary of quantitative genetics in its current manifestation, from heritability to QTLs. Throughout there is a successful weaving together of many strands: basic and advanced, modern and historical, mathematical and statistical, practical and theoretical. Each chapter is followed by a set of useful word problems that probe our understanding and illustrate puzzles one is actually likely to encounter in research. The chapters are nicely cross-referenced. I enjoyed reading this book and recommend it to you.

References

- HARTL, D. L. AND CLARK, A. G. 1997. *Principles of Population Genetics*. 3rd edn. Sinauer Associates Inc.
 PROVINE, W. B. 1971. *The Origins of Theoretical Population Genetics*. University of Chicago Press.

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Books received

Epistasis and the Evolutionary Process. Jason B. Wolf, Edmund D. Brodie III and Michael J. Wade (eds). Oxford University Press, Oxford. 2000. Pp. 330. Price £62.50, hardback. ISBN 0 19 512806 0.

Molecular Evolution and Phylogenetics. Masatoshi Nei and Sudhir Kumar. Oxford University Press, Oxford. 2000. Pp. 333. Price £65.00, hardback. ISBN 0 19 513584 9.