

Book Reviews

Sheep and Man. By M. L. RYDER. Duckworth, The Old Piano Factory, 43 Gloucester Crescent, London NW1, 1983. 846 pp. Price £55.00. ISBN 0 7156 16552

This is a work of immense scholarship. It traces the association between mankind and sheep from about 10000 B.C. to the present day. The book draws on every possible source for evidence – agriculture, anthropology, biology, geography, folklore and linguistics. Unless any reviewer can match the author in the compass of his interests, any disparaging comment should not fall lightly from his pen. Truth be told, he is probably not competent to review it in the first place, and I have no claims to be an exception.

Off-hand, I cannot recall a paper on *Ovis aries* appearing in *Genetical Research*. Reports on sheep genetics and breeding tend to go to rival journals, where the species is known simply as sheep, or occasionally as wethers, gimmers, hoggets and so on, depending. As far as this book is concerned, the geneticist is likely to find most professional interest in those sections that deal with the evolution and domestication of sheep. Dr Ryder traces the story in detail, and describes the consequences of domestication on the sheep's morphology and behaviour. There is a wealth of information pieced together, from artefacts and the archaeological evidence of prehistoric times to chromosome counts that became available somewhat later. When it comes to the written record, we are reminded that the first selection experiment to be reported in a refereed journal was Jacob's on sheep coat colour (Genesis 30: 32–43). Dr Ryder is too much of a gentleman, though, to note that Jacob used his superior genetic knowledge to cheat his father-in-law, which I suspect is the root cause of the deep mistrust in which flockmasters have held geneticists ever since.

Despite writing from a well-known genetical address, Dr Ryder does not oversell genetics. There are brief sections on topics like gene frequencies and biochemical polymorphisms, but Dr Ryder in the main is content merely to hint how the science of genetics fits into a much broader culture. In fact, I found the book to be more illuminating on Genghis Khan than on genetics and frankly, it is a more interesting volume in consequence. I did not know that *Penicillium roqueforti* was added to the curd before shaping a Roquefort cheese, which was apparently a comestible much appreciated by Pliny the Elder in AD 79. Pliny was not much of a microbiologist, and neither am I, but I shall now always think of him as someone who narrowly missed scooping Alexander Fleming.

Perhaps enough has been suggested of the nature of the book. It is full of information about sheep, with countless little nuggets that would take a very dull reader indeed not to appreciate. I found the linguistic information, for instance, to be quite fascinating, starting off with Babylonia meaning 'the land of wool'. But if I am to be allowed one small gripe, Dr Ryder should have had better advice on the Welsh language. Someone got confused between the genitive singular and the nominative plural, presumably a classicist who did not realise that Welsh was not a Romance language, and who in any event did not know the Welsh word for brown (gwineu).

My main concern is that the book may not reach the audience it deserves. It is a pity that the Gideons could not take it up. It is too big to take with you on your travels, and too expensive to leave on your shelf, where your friends will nick it. It is in fact first-rate bedside reading, fully as good as Fowler's *Modern English Usage* or the Oxford *Book of Quotations*. Where else are you likely to learn that

For beer to knock you sideways, and for girls to make you sigh,
You must camp at Lazy Harry's, on the road to Gundagai

provided, that is, that you are prepared to camp with some itinerant Australian sheep shearers. I am not sure, though, that I want to recommend such a pastime. Dr Ryder reminds us further of the lament of the shearer's wife:

Friday night he's too tired; Saturday night too drunk;
Sunday too far away.

Perhaps that is why he called his book 'Sheep & Man', though there may be another reason on pp. 315–316, which I must allow the reader to look up for himself. After all, and unlike Dr Ryder, I am not prepared to go into good black print and slur the name of a smart Highland regiment. Good grief, no.

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Statistical Analysis of DNA Sequence Data. Edited by B. S. WEIR, Marcel Dekker, AG Verlag/Publishers, Elisabethenstrasse 19, Postfach 133, 4010 Basel, Switzerland, 1983. Pp. 255 Price \$45.00. ISBN 0 8247 7032 3

The recent advances in molecular genetical techniques have already resulted in large quantities of detailed information on genomic structure. Restriction enzyme map data and sequence data are accumulating rapidly: in DNA sequence data alone, over two million bases are stored in the EMBL nucleotide sequence library (version 4, August 1984). The rate of increase is staggering: DNA sequence data is growing at the rate of 0.8 million bases per year.

For workers in molecular biology and molecular evolution this is a time of immense opportunity. The interpretation of such data requires not only new conceptual frameworks but also new statistical techniques. The analysis of the new molecular genetic data also reveals many problems of interest to applied statisticians. It is to these three groups that 'The Statistical Analysis of DNA Sequence Data', edited by B. S. Weir, is meant to appeal.

Most of the authors are, however, in the field of population genetics or molecular evolution, and this is evident throughout the book. Six of the nine chapters are concerned with statistical problems of an evolutionary nature; the other three sit uncomfortably alongside. Molecular biologists will find the first chapter useful. Schaffer deals with the estimation of DNA fragment lengths from mobilities on a gel: a practical problem, although somewhat peripheral to the book's main theme. Chapter two, by Gingeras, reviews the growth of computer software for sequence analysis. The available programs reflect the needs of molecular biologists. No phylogeny programs are listed. Gingeras sketches this rapidly developing area and attempts to define its future direction. The utility of this chapter is unclear: lists of software will soon date. There is little discussion of the underlying algorithms. Researchers beginning to apply computer methods will notice that the machine dependence of various packages and the subsequent difficulties in implementation on foreign machines is not mentioned. There is, however, no discussion of the statistical aspects of sequence searches. Given the intrinsic high level of noise in DNA data, this is a surprising omission.

The need for statistical methods is not recognised by many molecular biologists. The unfortunate widespread use of parsimony methods for constructing evolutionary trees is discussed by Felsenstein. Maximum likelihood methods are developed as an alternative to this arbitrary practice.

It is clear that the 'Classical' theory of population genetics, based on gene frequencies, is inappropriate for the new classes of genetic data. The mathematical models developed