

practices and statistics in New Zealand and, in the genetics section, the definition of terms such as the New Zealand breeding index and information on rates of genetic improvement in the national herd. There is no doubt that the New Zealand dairy-cattle population has been improved by a coherent programme run by their Dairy Board and, as the authors point out, in terms of fat yield the New Zealand Friesian is the best or close to the best in the world. None of the authors have, however, been very closely involved with the design and operation of the programme.

The genetic principles are presented early but, because of the limited space, the pace is likely to be a little too quick for many students. In the appendix on biometrics, for example, the authors cover such basic statistics as mean and variance, less straightforward topics such as intra-class correlation and regression, and then move on to path coefficients and selection indices, all in ten pages. Some of the material in the chapters proper is of classic textbook nature, such as computations of inbreeding coefficients and relationships, some is found only in animal-breeding texts, such as that on selection indices, and the rest is information on the New Zealand methods, which I found the most interesting. A student of animal breeding is likely to want the basic material presented with more explanation, and an undergraduate in agriculture will not want all the detail.

The animal-breeding section seems free of obvious errors, although the treatment of generation interval on pages 270–272 is, at best, misleading: it is not correct to add up ratios of response per generation to selection differential for each path of improvement through sire and dam to son and daughter. The authors deal primarily with the contemporary comparison system used in New Zealand. Although they mention that BLUP is likely to be introduced, it is moot whether their readers who have just grasped the idea of mean and variance will find the concepts of statistical models with fixed groups and random sires at all clear.

I am not aware of any other book dealing in so much depth with both science and husbandry of any aspect of animal production. It provides a useful and coherent whole.

W. G. HILL

*Institute of Animal Genetics
University of Edinburgh*

A Dictionary of Genetics. Third edition. By R. C. King and W. D. Stansfield. Oxford University Press. 1985. 480 pages. £15.00 paperback, £25.00 hardback. ISBN 0 19 503495 3; ISBN 0 19 503494 3

This dictionary defines genetics as 'the scientific study of heredity' and gives a definition of heredity that occupies six lines. In practice the authors of the dictionary have taken a wide view of the subject and included a great deal of biochemistry, molecular biology, medicine and evolutionary biology within its scope. It does, however, remain a dictionary and avoids the tendency to become an encyclopaedia. Terms are generally defined concisely. Some terms do, however, require comparatively lengthy explanation and half a page of text and half a page of diagrams are used to define 'Holliday model' for instance.

I used this dictionary while editing proceedings of a conference on gene expression and found that in general it provided definitions of most of the terms that arose. One of the problems facing the compilers of a dictionary in this area is the way in which usage of terms develops. An instance of this is to be seen in the term 'enhancer', which this dictionary defines as 'a 72 bp sequence in the DNA of virus SV40 that enhances the transcriptional activity of genes present in the same molecule', and then gives four more lines of explanation. However, by mid 1985 the term has come to be used in a wider sense by many authors. Some other definitions also seemed to be more restrictive than current usage. For example, LD 50 is defined entirely in terms of radiation dose, ignoring its use

in chemical toxicology. Perhaps this is an instance of the substance of genetics limiting the usages covered by this dictionary. Certainly the eight lines devoted to the definition of 'sex' do not include the usage of a typical tabloid newspaper.

The dictionary originates in the United States and the spellings used are American. This is entirely reasonable as American is now the language of science. No British reader will have difficulty finding 'Heme' and will soon realise that 'Estrous' includes 'Oestrous'. Less obviously, 'Adrenaline' will be found defined under 'Epinephrine'. Of the countless acronyms that might be included, many are to be found, but 'TCA' is taken to mean 'trichloroacetic acid' not 'tricarboxylic acid'. The citric acid cycle is described, with a cross-reference from 'Krebs' cycle'. 'Cat' is included, but not 'CAT' (chloramphenicol acetyltransferase). 'HAT medium' is in and so is 'CAP', but 'cap' is cross-referred to 'methylated cap' and 'cap-site' is not mentioned. Restriction endonucleases are defined, but the names of individual restriction enzymes, so mysterious and sometimes rude to the outsider, are only partially listed.

The dictionary contains a number of appendices, including an outline classification of all living organisms according to the five-kingdom scheme used by Margulis, a list of domesticated species of plants and animals, and a chronology of the development of genetics from the invention of the compound microscope in 1590 to the Nobel Prize-winners of 1984. If you wish to find out who is in and who is not in then you have an additional reason for getting hold of this dictionary.

The production of the book is of a good standard with clear print. I found few typographical errors. For instance 'stromatolites' lacked its first 't' but was correctly placed in alphabetical order. In conclusion I would recommend this dictionary to anyone who seeks a clear definition of the usage of a wide variety of terms relating to genetics. The etymologies are not generally to be found, though there is sometimes an explanation of the origin of terms. This is not always needed: 'snurps' speak for themselves.

D. E. S. TRUMAN
 Department of Genetics
 University of Edinburgh

Genes. Second edition. By BENJAMIN LEWIN. Chichester: John Wiley. 1985.
 732 pages. £16.95 paperback, £45.05 hardback. ISBN 0 471 82068 7; ISBN
 0 471 807893.

This book is a very good introduction to molecular biology. It sets out to cover a field of enormous breadth and succeeds in putting over the subject in a clear and interesting way. The careful structuring of each chapter allows the information to be assimilated readily, a feature which will be greatly appreciated by students. This book is almost certain to become the Watson of its generation.

The odd thing is why it has been produced at all, since it differs little in substance from the first edition. There are, it is true, signs of 'extensive' reorganization throughout the book. These generally amount to alterations in the order of the sections. The text varies in only a few places, apart from the introductory chapters. While the rearrangement sometimes makes for greater clarity, there is often little to choose between the two versions. The new material – so important in keeping the book an 'up-to-date assessment of the field' – usually only amounts to two or three short paragraphs. Thus the T-cell receptor, the 'homeo box' and transgenic mice are mentioned but little more.

There have been some shifts in emphasis, with the second edition stressing the techniques and methods used to obtain results in some of the newer fields. This is valuable but is taken too far in a large figure which suggests that one might use restriction site polymorphism in genetic mapping in *Drosophila*. Recombinant DNA techniques have led to many advances but this is not one of them. Of course Lewin goes on to outline the