them—these are grouped by similarities in animal, mostly rodent, models. The story is completed with an overview, and conclusions are drawn about the relevance of the lesions seen in animal models to human disorders. References are listed at the end of each chapter and include those available up to 1985. The whole text is well indexed. The black and white line drawings are clear and complement the text. Although coloured light micrographs would have been welcome (but presumably prohibitively expensive) the black and white photographs are surprisingly good.

It is assumed that the reader is medically or biologically trained, familiar with basic genetics (even if, as in my case, from a long perspective) but the book is not directed toward the expert geneticist. As such, I found the presentation clear and logical and, above all, enjoyable to read. I like the balance between basic science and clinical relevance. The book should appeal to all students of embryology and developmental pathology of the skeleton from teratologists to orthopaedic surgeons. It is very good indeed.

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Exploiting new technologies in animal breeding, genetic development. C. Smith, J.W.B. King and J.C. McKay (eds). Oxford University Press, Oxford. 1986. Pp. xii+202. Price £30.00. ISBN 0 19 854209 7.

Ths history of the science of genetics is a fascinating drama, from the publication of Mendel's papers in 1866, their "discovery" in 1900, through the Crick/Watson race for the publication of the genetic code, to the exciting prospects of present day applications to animal breeding. A rational assessment of the exploitation of developments in genetics and reproductive biology requires a balance between the accelerating euphoria of possible scenarios and a cooler, rational, jaundiced appreciation of practical, ethical and economic constraints.

This book reports the proceedings of a seminar in the Commission of the European Communities Animal Husbandry Research programme held in Edinburgh in 1985. It is a good read and not to be missed by practising animal geneticists who want to glimpse a frame of this fast moving saga. In spite of the interest of the individual contributions the editors have had difficulty in setting out a discernible logical pattern to link it all together and there is at times a disconcerting (possibly inevitable?) variation in style and format. However, with one or two exceptions, the contributions generally fulfil a prime requirement of such an exercise in communication, that of clarity of expression at a level comprehensible by a range of specialists in the various facets of the field.

The coverage admirably straddles some of the areas of interest at the meeting point of reproductive biology, genetic engineering and their use in the genetic improvement of farm animals. These include the manipulation of the embryo, transfer of genetic material (at the DNA and chromosome level) and the applications for determination of sex, genetic change in farm animals (both for traditional and new products) and indirect identifications of breeding value. Overlap between these contributions has not been entirely avoided. Other contributions concentrate on specific genetic problems relating to control of double muscling in cattle the control of ovulation and the usefulness of ovulation rate measurements in the development of highly prolific stocks of sheep and pigs and the assessment of the possible value of embryo transfer and of sexed embryos and semen in cattle and sheep systems.

All in all an interesting, patchy chimaera of a book that will need regular updating by further descendants to keep up with the exciting facets of this developing drama.

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Nucleic acid and protein sequence analysis. A practical guide. M.J. Bishop and C.J. Rawlings (eds). IRL Press, Oxford. Pp. xviii+417. Price £19.00, $34.00 US PB; £30.00, $54.00 US HB. ISBN 1 85221 006 0 PB, 1 85221 007 9 HB.

The avalanche of DNA sequence data coming from molecular biology laboratories has created the need for an introduction to the computer procedures available to deal with this data. Many of the questions being asked about sequences are ones which computers are ideally suited to answer. Thus, programs should be used for locating restrictions sites, demonstrating open reading frames, calculating base, codon, and amino acid compositions, assembling contiguous DNA sequences from shotgun sequencing gels, and performing the important steps involved in formatting and annotating sequence information for publication. The details of these and other analyses are supplied in this new addition to the Practical Approach Series.

The chapters can be divided into those dealing with available DNA sequence analysis packages, databases, and the hardware on which they operate (Chapter 1-5), chapters on the processing of restriction fragment and sequencing information (6-9), and a series of chapters on more complex sequence analyses in which computers can be employed. Stormo (Chapter 10) discusses what, in eukaryotes, is the complicated problem of identifying coding sequences within DNA. Gouy (11) and Taylor (12) discuss the use of computer algorithms in attempts to predict secondary structures of RNAs and proteins respectively. Collins and Coulson (13) discuss methods

of sequence comparison and alignment and Bishop, Friday and Thompson (14) consider methods for inferring phylogenies from sequence information and suggest heuristic solutions to this dauntingly complex problem.

Thus, an insight is given into almost every type of analysis available for sequence information, and the book may be useful in familiarising molecular biologists with these tools. The book is devastatingly boring to read, and could only be used as a practical aid. However, I believe that most of the information it contains would be better supplied as sets of instructions with individual software components, rather than in this form. I fear that most of the book will be out of date in 3 years.

I have a more general reservation that this book may further encourage the automatic performance of sequence analyses which should be done more thoughtfully. Protocols are described for the computer-aided identification of coding sequences within eukaryotic DNAs and for the prediction of RNA and protein secondary structure even though the reliability of these methods is very low. Worse are the algorithms for the identification of sequence homologies in databank searches. The multiplicity of patently spurious "homologies" between sequences in the molecular biology literature shows that sequence comparison algorithms designed to detect weak homologies which do not carry out rigorous significance tests on the similarities they find are worse than useless. The problem is compounded because molecular biologists, keen to draw biologically meaningful conclusions from apparently random sequence information, will be psychologically disinclined to reject homology searching protocols which produce false positives.

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Oxford surveys on eukaryotic genes. Vol. 3. 1986. Norman Maclean (ed.). Oxford University Press, Oxford. 1987. Pp. vii+239. Price £25.00. ISBN 019 854200 3.

This is the third in a series of volumes which "was established to provide a forum for authoritative reviews of particular genes or gene families" (back cover), and as such consists of a collection of in-depth studies of various aspects of eukaryotic genes. Because each chapter covers very different and specialised areas, a single reviewer has little hope of critically commenting on the content of each section. However, the back cover further tells us that "these reviews will be valuable reference sources for scientists working in molecular genetics, . . . , and should also be useful for advanced undergraduates and graduate students", and I have therefore put myself in the position of the latter.

The first chapter, "Transposable elements in *Drosophila melanogaster*", by David Finnegan and Diana Fawcett, is a good review of the types of transposable element that have thus far been found in this favourite of the geneticist. There is very little introduction, as one should expect for a field that is being so well covered in other systems, nonetheless the writing is clear, and the chapter is made very useful by the inclusion of an extensive appendix listing the characteristics of the various transposable elements, including size, sequence where known, references, etc. The next two chapters cover the mammalian major histocompatibility complexes, both the class I genes (Chapter 3, Andrew Mellor) and the class II genes (Chapter 2, Susan Carson and John Trowsdale). Chapter 3 should really be read before chapter 2, as it contains a good introduction to the topic, followed by a description and discussion of what is known about the class I genes and their possible origins. Chapter 2 is more of a straight listing of the many and various class II MHC genes, with many details on the mapping of the genes, but little on their significance. With the exception of chapter 5, the remaining chapters are also straightforward descriptions of various genes or gene families, including fibronectin (Chapter 4, by Owens, Kornblihtt and Baralle), with a nice description of the fine detail and importance of alternative splicing; chicken crystallin genes (Chapter 6, by K. Yasuda and T. S. Okada); and the murine alphamylase loci (Chapter 7, Schibler *et al*). Chapter 5, "Splicing of yeast mitochondrial precursor RNAs", by H.F. Tabak and A.C. Arnberg, is much more informative from the point of view of the "advanced undergraduates and graduate students", containing, as it does, a good discussion of the mechanics of RNA splicing in those mitochondrial genes that contain introns.

Although all the topics in this book are well covered, I wonder if putting them all together in a book is really the right thing to do. As far as researchers are concerned, there may only be one or two of the papers of direct relevance, and as far as the student (or junior researcher) is concerned, the price is prohibitive, and the subject matter at times somewhat esoteric for casual reading. A book for the library.

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Genetics. Peter J. Russell. Little, Brown and Company, Boston, Massachusetts. 1986. Pp. xxii+896. Price £29.95. ISBN 0 316 76301 2.

There is no shortage of textbooks whose purpose is to accompany an introductory course in genetics. For the more committed student who will pursue genetics to an advanced undergraduate level, it will probably be most useful (and economical) to acquire a reasonably comprehensive text that can continue to serve as a general reference. Other students may be better served by a more basic text, such as this offering by Peter J. Russell. It is a well-presented package with an attractive cover illustration, an exceptionally clear typeface, and the usual liberal sprinkling of photographs and two-colour diagrams. At about 900 pages, its length is comparable with that of other recent texts, and it covers roughly the