book remains unchanged from the previous edition, with sections on: DNA as a store of information; Translation: Expressing genes as proteins; Constructing the cell; Control of prokaryotic gene expression; Perpetuation of DNA; Organization of the eukaryotic genome; Eukaryotic transcription and RNA processing; The dynamic genome: DNA in flux; and Genes in development. Post-translational events, the intracellular localisation of proteins, the control of the cell cycle, and RNA processing are now treated in more molecular detail. The development section in fact comprises three rather specific chapters, about 40 pages each, on vertebrate immunobiology, embryonic development of *Drosophila*, and oncogenes. Few human examples are used, except in two of these last three chapters: the two page discussion of imprinting gives just one mouse example.

A consequence of this approach is that other aspects of genetics get little treatment. For example, mitosis is discussed mostly in terms of the cell cycle; meiosis with Mendel's first and second laws figure concisely in the introductory chapters; and recombination, after two paragraphs mentioning its evolutionary significance, is analysed solely in terms of the mechanisms involved. There is brief mention of topics such as minisatellite repeats and their use in gene mapping and DNA profiling, but it would be hard for the student to appreciate their significance.

Genes has gone through five editions in a decade. The weight of the text has increased over the last three editions from 1.3 kg through 1.9 kg to the present 2.8 kg. Part of this growth is accounted for by the increased content, but much of it is because of the use of a larger type face. The book is well produced with many diagrams, now in full colour. Bigger does not necessarily mean better, so just how good is the latest version? The book tells an interesting story over a wide field, and it tells it clearly and generally with commendable accuracy. But it tells it in a "Just So" manner. Unlike the earliest editions, which tried to show what kind of work had led to the conclusions presented, experiments are not consistently integrated into the presentation of the topics. Molecular methods are described, but PCR rates just one page of text and one diagram of the basic procedure; I did not find a description of RT-PCR. The author explicitly states that the control of bacterial gene expression is now treated in terms of DNA-protein interaction rather than the original genetic characterisation. This makes for a clear presentation, but at a rather different level of understanding. Present day students often seem to find it difficult to think in genetic as well as molecular terms and this text would not help them. The book is excellent in its own terms, but before using it for teaching, it would be important to ensure that the very molecular approach is compatible with course objectives.

ALISTAIR STEWART

Molecular Genetics of Sex Determination. Ed S S Wachtel. (Pp 518.) London: Academic Press. 1994.

The title of this volume does itself a disservice by being both too inclusive as well as too exclusive. Aside from a single chapter on *Drosophila*, the contents are solidly mammalian. However, the treatment of humans extends beyond sex determination to include

molecular genetic and clinical aspects of sexual differential. As such, this book provides a thorough and current treatment of mammalian sex determination.

The book is divided into two parts. The first section begins with descriptions of the search for the mammalian Y chromosome located testis determining factor (TDF), followed by chapters detailing the basic biology of sex determination as elucidated through work on the mouse, marsupials, and *Drosophila*. The latter half of the book is devoted to human biology, with chapters ranging from sex chromosome structure through the molecular and clinical aspects of abnormal sexual development syndromes.

The initial two chapters provide an historic delineation (with much overlap) of the trials and tribulations of the search for TDF. Although these chapters may have been better located among the chapters on humans, the placement of these at the beginning of the book emphasises the intense effort to identify this gene. Substantial information has been obtained from mouse experiments, in particular relating to the genetic aspects of sex determination. These experiments are well covered, with chapters on the mouse Y chromosome structure, XX males, XY females, and X chromosome inactivation. Evolutionary conservation of X linkage across eutherians is discussed, as well as the utility of marsupials and monotremes in studying evolution and genetics of mammalian sex determination. A chapter on sex determination in *Drosophila* is well written and informative, but seems out of place in this volume. It appears in isolation without additional chapters on non-mammalian systems and offers no insights into mammalian sex determination. The remainder of the book is devoted to human sex determination and differentiation with initial orientation provided by chapters on the human Y chromosome structure and on the sequence homology between the X and Y chromosomes (which offers a particularly clear presentation of complicated information). These are followed by chapters on XX sex reversal, XY sex reversal, and X chromosome loss. The remainder of the book details genes and genetic defects associated with normal and abnormal sexual differentiation: androgen insensitivity, male pseudohermaphroditism, steroid 21-hydroxylase deficiency, and anti-Müllerian hormone activity.

Overall, the content provides a good overview and ample background on sex determination in mammals. In general, the chapters read well, and the information is detailed and complete. A fair amount of overlap occurs between chapters, particularly regarding the cloning of TDF. This may prove irritating to those who wish to read sequentially through the book, but it does allow each chapter to be complete unto itself. This book is recommended as a reference for researchers in the field of sexual development, as well as a current text suitable for graduate students.

ALAN J SCHAFER

Human Cytogenetics Database. A Schinzel. (£395.00. Annual upgrade £150, OUP estimate. Extra manuals £7.50 each.) Oxford: Oxford University Press. 1994

The long wait for the update of Albert Schinzel's *Catalogue of unbalanced chromosome*

aberrations in man has been worthwhile. In keeping with the times, this new edition comes as PC compatible software, using the software shell developed for the *London Dysmorphology Database*. The *Human Cytogenetics Database* is unarguably the most comprehensive catalogue available of the many rare cytogenetic aberrations and their clinical correlates and contains information on over 1000 autosomal chromosome aberrations. This information comes from more than 5000 references and there is now a continuing update system in place to ensure the database remains current.

The database may be used as a comprehensive source of references by those seeking details about the phenotype associated with rare cytogenetic aberrations as well as an aid to clinical and cytogenetic diagnosis. The clinical features associated with specific cytogenetic aberrations are conveniently listed, while patient clinical features are easily entered and then used to identify candidate regions of the genome that may benefit from more detailed cytogenetic assessment.

There are features in the program which will appeal to both cytogeneticists and clinical geneticists. Besides providing a list of clinical features associated with a chromosomal aberration, an extra table is created which summarises the frequency of occurrence of these features. This summary table, created from all the clinical data in the case reports from each reference, will become increasingly useful as the database expands.

Searching by using patient features uses the clinical features list created for the *London Dysmorphology Database*. For those familiar with the LDB, the likeness creates an encouraging familiarity. Searches are easily set up although clinical searches benefit from a flexible approach using knowledge about the frequency and likely specificity of the various anomalies. Likewise, clinical interpretation of cytogenetic aberrations is dependent on the accuracy of the cytogenetic detail and, occasionally, extra contributing molecular information. Rather than lessen the need for cytogenetic and clinical skills, the *Human Cytogenetics Database* highlights the value of each and how interdependent these skills are. In addition, the comprehensive reference list is easy to search or browse through.

A helpful feature of the program is the capacity to jump to the right position in a list containing several thousand items. This feature, developed for the LDB, is useful for the reference list. However, it has limited application in the main list of chromosomal aberrations which has no simple numerical code to allow a jump to a particular chromosome. The program also has a section which provides an IQ measurement, based on data from the published case reports of chromosomal aberrations associated with mental retardation. Unfortunately, this potentially useful summary statistic cannot be obtained from the program. OUP have indicated the underlying fault is minor and should be overcome by the next upgrade. One advantage of the database over the earlier book is inclusion of uniparental disomy for a number of chromosomal regions.

Further comparison with the book shows two disadvantages. The first is exclusion of sex chromosome abnormalities which makes the database less encyclopaedic. The second is the lack of a brief introductory summary for each abnormality. The summary tables do give this information in a numerical form, but this is less digestible than the format of

the book. For example, searching through del(15)(q12), upd(15)mat, or upd(15)pat would give the frequency of clinical features in these conditions, but the terms Prader-Willi or Angelman are not encountered unless individual references are examined. Similarly there is no overall summary of triploidy, only summary tables of clinical features for 68,XX, 69,XXX, 69,XXY, and 69,YYY separately.

The database takes up 12 Mb of hard disk space run on computers that are compatible with the IBM XT, AT, or PS/2 range of personal computers with a minimum of 640 K of RAM (MS-DOS version 3.3 or higher). The manual, written in clear English, is reassuringly brief with a quick start guide which is a useful introduction to the database. In addition, on line help is easily accessed while the program is in use. The *Human Cytogenetics Database* is a useful reference for both the cytogenetics laboratory and the genetics clinic, and the planned regular updates will make it even more valuable.

M CREASY
D RAVINE

Understanding Genetics: A Molecular Approach. Norman V Rothwell. (Pp 655.) London: Wiley Liss. 1994.

It is a considerable challenge to write a textbook that aims to encompass most aspects

of molecular genetics and make the general principles pertinent to human genetics. *Understanding Genetics* starts arrestingly: "1900 was a highly significant year for the science of heredity, for it was then that the work of Gregor Mendel was discovered". From these foundations the book deals with classical studies on mitosis and meiosis, inheritance, relationships of genotype and phenotype, linkage, and aneuploidy. These chapters are followed by sections on the discovery of DNA structure, transcription, translation, mechanisms of gene mutation, prokaryotic genetics, and control of gene expression. The book concludes with chapters on techniques of gene manipulation, molecular biology of human diseases, and non-chromosomal genetics.

The major difficulty in writing a textbook with a broad remit is in deciding what to leave out. Rothwell's "curriculum" gives the necessary emphasis to the fundamental concepts of genetics and in my view avoids the trap of concentrating on recent advances in human genetics at the expense of the basics. However, my personal preference would have been to lengthen the human genetics section. I would have liked to see some examples of how the identification of genes and their products (like the cystic fibrosis transmembrane conductance regulator or the LDL receptor) has contributed to the overall understanding of biology. Furthermore, a con-

temporary textbook should perhaps include more detailed discussions on gene therapy, the Genome Project, and the uses of transgenic animals in research.

I admire Dr Rothwell's teaching approach. He tends to concentrate on concepts rather than detail and constantly reminds the reader of the biological relevance of issues. This was particularly successful in the earlier chapters of the book that include fine explanations of the concepts of dominance, recessiveness, and variable penetrance. Occasionally, too little detail compromised explanations: the sections on chromosome walking and inverse PCR were possibly too sketchy to convey the elegance of the methodologies. However, other techniques like chromosome jumping and cosmid and YAC cloning are made very clear. The writing style is clear, unfussy, and engaging. Diagrams are well set out and easy to follow. Each chapter ends with useful self-assessment questions (and answers are provided at the back of the book).

This textbook can be highly recommended for undergraduates with a background in elementary genetics and provides an excellent syllabus for a third year course. In addition, it could serve as a useful refresher in fundamental genetics for postgraduates and clinicians. I enjoyed reading this book and found it most educational.

DAVID RUBINSZTEIN