BOOK REVIEWS

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Human Cytogenetics: A Practical Approach. Ed D E Rooney, B H Czeulowski. (Pp 274.) Oxford: IRL Press. 1992.

This is the second edition of this popular handbook. It contains major revisions and additions, the most obvious being the two volume format, which the editors have wisely chosen to accommodate the much expanded text: volume I is based primarily on the subject matter of the first edition, but also includes new chapters on non-isotopic *in situ* hybridisation and microscopy/image analysis, while volume II is essentially a new publication dedicated to the cytogenetics of malignancy and related topics such as the chromosome instability syndromes.

Volume I begins with a useful introduction to clinical cytogenetics, which deals briefly with nomenclature and chromosome abnormalities. This is followed by three chapters on tissue culture and staining techniques, which do not differ greatly from the first edition and are all technically excellent. However, the wisdom of recalling past exploits with blood infected by dangerous pathogens in this particular text is questionable, although the resourcefulness of early workers in obtaining serum for tissue culture must be admired. The next chapter deals with the clinical interpretation of chromosome abnormalities and is all the more useful for having a clinical as well as a scientific input. The treatment of the subject, on the whole, is admirable and is a distinct improvement on the comparable section in the first edition. One or two minor errors and omissions, such as the emphasis on the *in situ* method of harvesting for the interpretation of mosaic amniotic fluid results, which ignores the fact that most laboratories in the UK use the suspension method, only detracts slightly from the content in general. Chapter 6 deals with the emergent and rapidly advancing new development of *in situ* hybridisation. This is an impressive, very timely chapter, written by acknowledged experts in this field, and containing some elegant illustrations. The chapter on meiotic chromosomes, on the other hand, which had little scope for improvement, apart from the use of chromosome painting to differentiate bivalents, reinforces our view that this is a technique which is likely to remain primarily a research tool. The chapter on microscopy is informative, although the use of phase contrast could usefully have been included, perhaps instead of the more esoteric data on the properties of lenses. The section on automated image

analysis and the chapter on flow cytometry round off the volume appropriately.

Volume II covers cytogenetics in malignancy and acquired abnormalities. As is to be expected, the bulk of the volume concentrates on the haematological malignancies. The first chapter introduces the techniques involved in the study of leukaemic chromosomes, and also places a very welcome emphasis on the many problems associated with both their culture and analysis. Chapters 2, 3, and 4 deal with the cytogenetics of myeloid leukaemia, acute lymphocytic leukaemia, and the lymphoid and chronic lymphoproliferative disorders respectively. They are all very thorough, up to date, and well illustrated with good photographs (in particular the acute lymphocytic leukaemia chromosomes). Chapter 5 gives an overview of the role of cytogenetic studies in haematology, and relates the findings to the overall clinical picture. Although containing repetition of material already competently covered in the preceding three chapters, it should prove informative to cytogeneticists with a limited knowledge of haematology. Chapter 6 deals with the growing field of solid tumour cytogenetics, and gives detailed protocols for their culture, as well as discussing the problems of interpretation of results. Chapters 7 and 8 cover cytogenetic testing for mutagenicity and the chromosomal instability syndromes, and both provide an excellent guide for any occasional user of the techniques. The final two chapters concentrate on the more specialised areas of somatic cell hybrids and the microdissection of human metaphase chromosomes. These seem somewhat out of context in relation to the rest of the volume. In general the content of this volume is of an excellent standard and it compares very favourably with existing texts.

This new edition has significantly improved what was already a very useful publication. The few deficiencies of the first edition have been addressed, and the new volume provides a new dimension to the book. The standardised approach to the presentation of protocols in both volumes is a successful innovation, and in more than doubling the size of the book, the editors have put together a quite comprehensive compendium of practically orientated information that will be invaluable as a reference handbook and for teaching. The editors have quite correctly contended that it will meet some of the training needs of new recruits, and we would have no hesitation in recommending the book to our cytogenetic trainees. However, more experienced workers in this field would, we suspect, only occasionally need to resort to it, since most established laboratories have their own preferred protocols. The overall organisation of the book is excellent, but a relatively minor criticism we have is with regard to the mix of chapters in volume II; in any future edition the editors might consider whether the final two chapters in this volume might be better placed in volume I.

SELWYN H ROBERTS
PETER W THOMPSON

Prenatal Diagnosis and Screening. Ed D J H Brock, C H Rodeck, M A Ferguson-Smith. (Pp 785; £95.00.) Edinburgh: Churchill Livingstone. 1992.

Some 20 years ago it became clear that the study of amniotic fluid and the cells con-

tained in it provided a means of diagnosing certain genetic disorders in the fetus. This offered solace to couples at risk who previously had had no option but to have no further children themselves or face the prospect of having another affected child. Since those early days the field has developed considerably. The range of techniques has increased as have the number of disorders which can be diagnosed and, in this regard, the application of molecular technology has been particularly valuable. There are unpublished reports on the subject which are often only available to the specialist. There has therefore been a real need for a text which would review the entire field in such a way that it could provide an authoritative reference work. The editors of this current text are admirably qualified for the task, for each has played a singularly important role in the development of prenatal diagnosis: the prenatal diagnosis of neural tube defects (Brock), fetoscopy and fetal blood sampling (Rodeck), and screening for cytogenetic abnormalities particularly in older mothers (Ferguson-Smith). They have enlisted the collaboration of many internationally recognised experts who address all aspects of the subject, ranging from counselling, fetal sampling, and laboratory techniques to the diagnosis of specific congenital malformations, chromosome abnormalities, and a variety of mendelian disorders. An entire, and particularly interesting, section is devoted to future trends (preimplantation diagnosis, molecular cytogenetics, and fetal cells in maternal circulation). Finally, the psychological, societal, and legal aspects of prenatal diagnosis are given detailed consideration.

Not all contributors write with quite the same ease and clarity. Some are verbose, others perhaps too brief. Some feel obliged to quote even the minutiae whereas others are more eclectic. But such strictures are almost to be expected and inevitable in any edited volume on a subject which has become so broad that its review is now beyond the talent of any single author.

This volume will, of course, have competitors, most notably the new edition of Aubrey Milunsky's *Genetic Disorders of the Fetus*. Nevertheless, as a scholarly review of an important aspect of medical genetic practice this is likely to become a standard text. It is also beautifully produced and a pleasure to read and handle.

ALAN EMERY

Genetics and Neurology. 2nd edition. Sarah Bunday. (Pp 480; £60.00.) Edinburgh: Churchill Livingstone. 1992.

I was delighted to receive a copy of the second edition of Dr Bunday's book, *Genetics and Neurology*, for review; the first edition is one of the most used books on my bookshelf. A second edition was made necessary by the rapid advances in our understanding of the molecular genetics of the major neurological disorders and these are well covered. The increasing awareness of the importance of mitochondrial disease is reflected by the addition of an extra chapter dedicated to the subject.

Dr Bunday has not intended her book to cover all neurogenetic disorders, but rather to concentrate on the more common conditions. For each disease there is a very lucid

clinical description, followed by a critical analysis of the relevant genetic data and information concerning recurrence risks. The book lists all the key references for each group of disorders.

My only regret in the difference between this and the first edition is that the extra chapter on mitochondrial disease has meant that the appendices in the first edition have been omitted. Although the issues with regard to frequency of consanguineous matings and parents of patients with autosomal recessive disease (appendix 1, first edition) and Bayes' calculations for X linked disorders (appendix 2) are covered in other texts, I found the list of neurological disorders inherited in an X linked fashion a very useful reference source and I would hope that Dr Bunday might consider including it in any future editions.

Who will find this book useful? Within the field of clinical genetics, I think that it is a book that all trainees and consultant clinical geneticists should consider owning. In my own practice, I find that I use this book and Dr Baraitser's book, *The Genetics of Neurological Disorders*, to address different problems. For the commoner diseases, where I am unsure of the clinical features, I start with Dr Bunday's book and move on to Dr Baraitser's book if I want to cross check anything. For the rarer disorders and for an exhaustive review of published reports I use Dr Baraitser's book.

In addition to clinical geneticists, I think Dr Bunday's book will be of enormous use to consultants and trainees in paediatrics and neurology. The extensive re-revision of the text, particularly with regard to molecular genetic diagnosis of neurogenetic disorders, means that for all those who purchased a first edition, serious consideration should be given to buying the second edition.

SUSAN HUSON

An Atlas of Clinical Syndromes: A Visual Aid to Diagnosis. 2nd edition. H R Wiedemann, J Kunze, F R Grosse, H Dibern. (Pp 564.) London: Wolfe Publishing Limited. 1992.

Professor Wiedemann and his associates have contributed greatly to the delineation of syndromes over several decades, and this atlas reflects their experience and the value of careful documentation and follow up. The atlas is now in its second English edition and each entry follows a format with text on one page facing illustrations opposite. The text is telegraphic in style divided for each syndrome into main signs, supplementary findings, aetiology, frequency, course, treatment, and references.

Many of the illustrations are old and some are taken against a dark background; consequently some appear indistinct and it is difficult to see abnormalities of skin texture or pigmentation. Some well delineated syndromes are not illustrated, such as VATER, HARD +/- E, Pena-Shokeir, and CHARGE association, though I did wonder whether the 'unknown' syndrome on page 44 could be this latter disorder. The inclusion of the authors' 'unknowns' spread throughout the atlas is a little idiosyncratic and does not help the organisation of the book, which is not explicit anyway.

This atlas, although enlarged in this edi-

tion, has not been extensively rewritten and as a consequence recent knowledge about the genetic basis and mechanisms underlying some of the syndromes is not included. For example osteogenesis imperfecta types IIA-C are referred to as usually recessive disorders whereas recurrences in some families have now been shown to be the result of parental germinal mosaicism.

Most dysmorphologists like to have all the available 'syndrome books' to see different cases illustrated at varying ages. Although this atlas would not be my first choice, it is good value, reasonably comprehensive, and constitutes a helpful contribution to the body of publications.

DIAN DONNAI

Inherited Ataxias. Advances in Neurology. Volume 61. Ed A E Harding, Thomas Deufel. (Pp 217; \$119.00.) New York: Raven Press. 1993.

The recent advances in understanding some of the ataxias exemplify the different ways in which genetic and other studies can help to elucidate the causes of disease. This interesting volume presents many new and exciting aspects of ataxic conditions, some of which are not yet fully explained. It is an enjoyable and stimulating book.

First there is a clear account of the classification of ataxic disorders, which emphasises the recognition of those few syndromes that are treatable. An improved delineation of cerebellar syndromes can be made with modern imaging, for MRI techniques show how the cervical cord is atrophied in patients with Friedreich's ataxia while the cerebellum appears normal, whereas in early onset spastic ataxia, the cervical cord is normal but there is atrophy of all parts of the cerebellum. In adult onset ataxia type I (ADCA type I) MRI scanning shows atrophy of the entire cerebellum together with atrophy of the pons, middle cerebellar peduncle, medulla, and upper cervical cord. However, MRI findings in pure cerebellar atrophy (ADCA type III) show atrophy confined to the cerebellum. Patients with the spastic ataxia associated with neuropathy (Charlevoix-Saguenay ataxia) have atrophy of the superior cerebellar vermis and atrophy of the cervical and thoracic segments of the spinal cord.

Gene mapping has been successfully accomplished in Friedreich's ataxia, ataxia telangiectasia, and some families with ADCA type I. In Friedreich's ataxia there is substantial evidence that only one gene locus is involved; its localisation is a tribute to international cooperation and a lot of hard work and it was the third disease gene locus to be identified. However, it is proving difficult to pinpoint the gene more accurately, owing to its position near the centromere on chromosome 9 and the uninformative markers used in the early studies. Recent identification of CpG doublets (which usually lie alongside coding sequences) and the use of yeast artificial chromosomes to clone segments of DNA from the region are valuable strategies. Moreover, Chamberlain *et al* are screening cDNA libraries obtained from fetal and adult brain and cerebellum. The prospects for finding and sequencing the gene look promising. Ataxia telangiectasia is an interesting condition in which the type of

gene that could cause such varied effects on the immune system and on chromosome stability is not known, but work with lymphoblastoid cell lines (Lindahl) suggests that a phosphodiesterase may be deficient.

Homologies with mouse diseases have been fruitful in a number of genetic disorders, and dominant ataxia is no exception. Desai *et al* have studied the phosphoinositide metabolism in the cerebellum of mice with the Lurcher mutation. Abnormalities were found in the cerebellums of Lurcher mice and of human patients with ADCA type I, and warrant further study. A long and detailed chapter on neurotransmitters in the cerebellum illustrates their complexity, but at present does not point the way towards effective treatment. Two chapters on regeneration of neurones in cell culture and on Purkinje cell transplants in mice indicate possible future therapeutic strategies.

It is useful to have in this book an up to date account of the fascinating group of neurodegenerative disorders known as prion diseases. The diseases are clinically variable, with ataxia and presenile dementia being the two commonest features. In humans the disease may be inherited as an autosomal dominant (five point mutations and two insertions in the prion protein gene have been described) or may be acquired (by the rare inoculation with an aberrant prion protein which then catalyses a post-transcriptional event so that further abnormal prion protein is derived from the host's genome) or, most commonly, by an unknown mechanism different from the first two. It is interesting that the host's genotype plays some part in the manifestation of disease. In inherited prion protein disease, homozygosity for a polymorphism of codon 129 leads to early onset of disease, while the few patients who have developed Creutzfeldt-Jacob disease after being given cadaveric derived growth hormone are predominantly homozygous for valine at this position. Patients with sporadic Creutzfeldt-Jacob disease are more often homozygous for either valine or methionine at codon 129 of the prion protein than would be expected from the distribution of these polymorphisms in the general population.

It used to be thought that the neurodegenerative disorders formed a depressing group of conditions because no prevention or treatment could be envisaged. However, this book illustrates that such a view is no longer true and that there are great possibilities for the future at least in regard to the ataxic conditions. This volume, therefore, in the series of *Advances in Neurology*, is of great interest to neurologists and to those geneticists interested in neurological diseases.

SARAH BUNDEY

Genetic Engineering. Medical Perspectives Series. J Williams, A Ceccarelli, N Spurr. (Pp 132; £14.00.) UK: Bios Scientific Publishers. 1993.

A useful addition to this instructive series, *Genetic Engineering* provides an excellent introduction to the technological wizardry behind the science of molecular genetics. Little previous knowledge is assumed and the text