Genet. Res., Camb. (1993), **61**, *pp.* 75–78

Book Reviews

Our Genetic Future: The Science and Ethics of Genetic Technology. Report of a Working Party of the British Medical Association. 1992. Oxford University Press. 263 pages paperback. Price £7.99. ISBN 0 19 286156 5.

This little book will join the other popular science paperbacks in general bookshops and, with its appealing title and intriguing cover illustration of a human figure with what I, as a geneticist, guess are chromosomes distributed over its body, appears to be an authoritative discussion of British Medical Association views aimed at the general reading public. However, the list of references at the end of the book assumes that the reader has access to a good science library, of the kind found in universities, so I think the authors really had the medical profession particularly in mind. Bearing in mind that our medical students only get on average 5 to 6 hours of genetics teaching before they qualify, the authors had a difficult assignment.

The first half of the book gives us a much simplified picture of the historical development of modern genetics and its applications – under such headings as Life and Heredity. Molecular Biology and its Techniques, Modifying Micro-organisms, Plants, Crops and Animals, and Genetic Screening and Gene Therapy in People. The rest of the book gives a useful discussion of the many legal and ethical problems subsumed under the headings: Current Laws and Guidelines, Implications of Genetic Modification in Animals, Plants and Micro-organisms and to Pharmaceutical Products, Patenting Genetically Modified Organisms, Implications of Applying Genetic Modification to People, and Implications of the Human Gene Project. The book ends with a summary and conclusions, a list of references, a glossary and an index.

The early chapters are clearly intended to give us easy access to the genetic knowledge needed to take a critical view of the many techniques of modern genetic technology and its prospects and dangers; but this would require a far more detailed training in genetics than we get here. What we are presented with is a *Reader's Digest* style short course, built mainly round the major names in genetic history, such as Darwin, Mendel and Morgan – well written but somewhat superficial. Many essential terms get over-brief explanation in the text, e.g. chloroplasts, mitochondria, ribosomes, photosynthesis, transposons, primitive streak, homeotic selector genes, transcription factors, but are not included in the Glossary, so that when one meets them again much later in the book one has to search back, with much wasted labour. Some of these are listed with several page numbers in the very comprehensive index, which also takes time to scan.

There are occasional infelicitous passages which stopped me in mid-reading. Thus on pages 40–41 we have a section headed 'The book of life – with misprints' in which biological information is compared with the written words of a book. Two paragraphs setting out this analogy in detail seem to me a terrible waste of space, which may mislead some readers. A little later, a section is headed 'Chasing the DNA', for no better reason than that the work of Martha Chase is described immediately below. I think that such puns are better left to the sports pages of the *Guardian* newspaper. Page 55 refers to 'a bioreactor (sometimes rather imprecisely called a fermenter)', but neither of these terms is defined. No doubt this passage was written by a biotechnologist whose bioreactor is continually misnamed by visitors; he has my sympathy but he should give us definitions of the two terms. On page 56 we read that 'the human genome consists of three thousand million (i.e. one billion) base pairs'. There is a double element of confusion here, involving bases and codons on the one hand and British and US billions on the other. The term billion, meaning a million millions, was coined in sixteenth-century France, and was later changed to meaning a thousand millions in France and the USA, but not in the UK. So authors using the term 'billion' should declare their nationality.

These are perhaps rather minor complaints, and my main criticism of the early chapters is that they will leave any inexpert reader with a very superficial view of the enormous subject included under the term 'genetics', while anyone with some knowledge of genetics will want to skip them.

The remaining chapters present us with a great deal of absorbing information on what is going on in the biotechnical world, but there are also problems with all this new knowledge. In many of the cases discussed, it is not made clear what has actually been achieved

and what is still in the pipeline and may turn out to be incorrect. So these chapters also leave us in the air. The real problem here is that, while there is quite an extensive list of references, it is not connected up with the numerous statements in the text, so that one does not know where to look for further information on such exciting topics as the use of somaclonal variation, plants with a built-in insecticide (does eating such plants do one any harm?), Calgene's 'Flavour Saver Gene' in tomatoes (since Calgene is an American company, this should surely have been spelt 'Flavor'), stealing a virus's clothes to make tomato and potato plants resistant to potato X and potato Y virus, and so on. For those of us – (geneticists, MPs, MEPs as well as the person in the street) worried about the speed of progress and possible dangers inherent in such projects, this book is not sufficiently helpful. Can we look forward to an expanded version, with a fuller list of references properly integrated into the text? This would of course be a major undertaking for one author, let alone a committee; and meanwhile knowledge, published and unpublished, accumulates at an awe-inspiring rate.

So, in my opinion, this book fails to fulfil the expectations of its title and is likely to be found frustrating by many of its readers. But it will at least give the reader many good talking points for parties and dinner tables, and the exciting prospects of which we are given a taste should help to line the empty coffers of some of our university research teams.

ERIC REEVE
Institute of Animal Genetics
University of Edinburgh

Human Cytogenetics: A Practical Approach, Volume II: Malignancy and Acquired Abnormalities (second edition). Edited by D. E. ROONEY and B. H. CZEPULKOWSKI. IRL Press at Oxford University Press. 1992. 293 pages. Price Paper £22.50, ISBN 0 19963313 4. Spiralbound £30.00 ISBN 0 19 963290 1.

The second edition of this book (the first appeared in 1986) has undergone a form of mitosis resulting in two 'daughter' volumes of equal size but very different content.

The second of these volumes is entitled *Malignancy and Acquired Abnormalities*. Two-thirds of this volume deals with the cytogenetics of malignancies. As befits our current state of knowledge, five chapters are devoted to leukaemia cytogenetics followed by a chapter on solid tumour cytogenetics. The remainder of the book deals with Mutagen-induced Chromosome Damage; Breakage Syndromes; Somatic Cell Hybrids; Flow Sorting and Microdissection. Most of the contributors are UK cytogeneticists working in diagnostic laboratories, and all have a great deal of practical experience.

The section of the book which will probably be referred to most frequently by practising cytogeneticists is that on leukaemia cytogenetics. A useful overview chapter on methodology is followed by three largely descriptive chapters on the cytogenetics of myeloid, acute lymphoid and chronic lymphoid leukaemias. These chapters are well illustrated with pictures of chromosomes of varying quality: accurately reflecting what is seen down the microscope! These chapters also sensibly address the question of what approach to analysis should be adopted. References to the use of other techniques (see fluorescence in-situ hybridization) to confirm and support conventional cytogenetic findings could perhaps have been expanded. This section of the book is rounded off by a stimulating review of the role of cytogenetic findings in leukaemia. This chapter is particularly perspicacious in that it is written by a clinical haematologist. Anyone who remains to be convinced that the cytogenetics of leukaemia is little more than a glorified form of stamp collecting should read this chapter.

There is an adequate index and a useful glossary of haematological terms together with a list of reagent suppliers.

This volume and its 'sister' are aimed primarily at practising cytogeneticists as a technical *vade mecum*, and as such can be recommended. The nature of the information is such that it won't date too quickly, and at the asking price is well worth the investment.

JONATHAN WATERS
Regional Cytogenetics Laboratory
East Birmingham Hospital
Bordesley Green East
Birmingham B9 5ST

Introduction to Theoretical Population Genetics. By THOMAS NAGYLAKI. Spinger-Verlag. 1992. 369 pages. Price £35.00. DM. 98.00. ISBN 3 54 053344 3.

Mathematical models and methods have a long history in genetics, tracing back to Gregor Mendel, who used elementary mathematics to calculate the expected frequencies of the 'genes' in his experiments. In fact, he had studied mathematics and physics (at the University of Vienna), and this educational background may have influenced him to introduce the atomistic approach to heredity, and to formulate abstract models. Later, Hardy and Weinberg used simple mathematics to derive what is now called the Hardy–Weinberg law. Since the pioneering work of Fisher, Wright and Haldane, mathematical models and methods have become common in population genetics. Numerous good textbooks and monographs have been published, many of these treating probabilistic or statistical aspects of theoretical population genetics. Others, like those of Crow and Kimura, or Ewens, give a broader overview of mathematical models in population genetics.