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Book Reviews

Human Genetics: Problems and Approaches. Second edition. By F. VOGEL and A. G. MOTULSKY. Berlin, Heidelberg, New York, Tokyo: Springer-Verlag 1986, 807 pages. Hard cover DM 148, £52.25. ISBN 3 540 16411 1.

The first edition of *Human Genetics* appeared in 1979 and has become a classic text. It is the book to which many professionals turn when planning a course of lectures and also the book they use for a better understanding of the historical development of particular topics in the practice of human genetics. The fact that there are few competitive texts has been a tribute to the excellence of the first edition; anyone petitioned by another publisher would be daunted by the scholarship that Professors Vogel and Motulsky bring to their writing.

The long-awaited second edition is no disappointment. The most spectacular advances in human genetics in the 1980s have come from the impact of molecular biological techniques on the understanding of gene and chromosomal structure. The basic format of the first edition is carried unchanged into the second, and molecular genetics is worked into the text where it is relevant and where its contributions have illuminated practice and understanding. It is possible that this approach may disappoint some of the new generation of molecular biologists for whom life began with the Southern blot, but for most geneticists the traditional approach has all the virtues of a complete story.

This is a point worth emphasizing. A majority of practising human geneticists are clinicians, concerned with the nosology and diagnosis of genetic disorders and with the prediction of occurrence and recurrence risks. Their preoccupations are in the counselling clinic and their focus is on anxious parents who want advice on the avoidance of a range of distressing conditions. Molecular biology has had considerable impact on clinical genetics, both in terms of disease classification and in terms of diagnosis. But it has also tended to concentrate the attentions of human geneticists on Mendelian disorders and to divert them from the more difficult multi-factorial conditions. In defence of this altered emphasis, it must be said that by attacking the multi-factorials through those families where Mendelian segregation is apparent, spectacular advances have been made in the diagnosis of disorders such as Alzheimer's disease, manic-depressive illness or coronary heart disease. But it has reinforced the old adage that geneticists can only count up to two.

This is where Vogel and Motulsky's book is such a fine corrective. Human genetics is about gene flow in populations, and about the extent, origins and consequences of human variation. The pathology of the Mendelian-segregating disease gene is a small part of the subject; of much more concern is how and why mutation occurs and what happens when it does. Two-thirds of *Human Genetics* is directed to these themes, chapter 5 on mutation, chapter 6 on population genetics, chapter 7 on human evolution and chapter 8 on genetics and human behaviour. Even the final chapter, on practical applicatons, devotes a section to the biological future of mankind. All these themes are magnificently dealt with; I know of no other book which has the sheer authority of Vogel and Motulsky.

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Natural History of the Major Histocompatability Complex. By JAN KLEIN. New York, Chichester: John Wiley & Sons. 1986. 775 pages. £90.75. ISBN 0 471 80953 5.

I found this book absolutely absorbing (it grips you like an antibody grips its antigen), and I most strongly recommend it to any biologist, laboratory or library with £90 to spend: they will certainly find it both unique and excellent value. The book is offered as a celebration of the 50 years of research, always growing

more intensive, since the Mhc was discovered. It is very well illustrated with figures and tables, and presents the many aspects of an extremely complex and confusing subject with remarkable clarity.

Professor Klein explains that he was inspired to write a natural history of the Mhc by Buffon's great *Histoire Naturelle* (how many of us, I wonder, have dipped into those 36 volumes?). He has designed the book 'for anyone who is working on one particular aspect of the Mhc but wants to step back and view the complex in its entirety, for anyone who wants to be introduced to the Mhc, and for anyone who is just curious about this much-talked-about region'. The needs of these diverse customers are met by presenting the whole story in its historical context and discussing the many cul-de-sacs which led numerous scientists astray, as well as their steps forward and the arguments and problems still to be resolved.

A good deal of basic molecular biology and genetics is included to help the reader with a rather general biological background, and – of particular value – the numerous experimental procedures and tests which have advanced our knowledge are explained in detail and their merits and limitations are assessed. As an aid to readability the author has also tabulated most of the detailed information, so that the text is not cluttered up with the wealth of factual material being presented. Jan Klein suggests that this makes the book suitable for reading in bed, and the only problem there is its size and weight.

The book is in large format ($8\frac{1}{2} \times 11$ inches), solidly bound in hard covers. Its 762 pages (excluding 13 pages of index) contain a short historical first chapter (The Story) and nine very solid chapters entitled The Gene – Organismic Approach, The Gene – Molecular Approach, The Protein, The Antibody, The Cell, Function, The Population, Sociology, and Evolution. Each chapter has a number of subheadings listed in the general Contents list, and many sub-subheadings listed in the separate contents lists which begin each chapter; and this structure makes it particularly easy to find one's way in the book. As examples, putting sub-subheadings in parentheses, we find in chapter 2: *HLA* Complex (Chromosome localisation, *HLA* loci) and *H-2* Complex (A mouse is not a mouse, Genetic map of chromosome 17, chromosomes 2 and 18, Identification of class I loci, Identification of class II loci, *H-2* recombinants, *H-2* mutations).

Forgetting sub-subheadings, which are very numerous in chapter 6: The Cell, its subheadings are: T Lymphocyte, Lymphocyte activation, T-cell receptor, T-cell clones, Mixed lymphocyte reaction, Cell-mediated lymphocytotoxicity (CML), Graft-versus-host reaction, delayed-type hypersensitivity and contact sensitivity, Allograft reaction, Transplantation tolerance, Nature of alloreactivity. This chapter occupies 131 pages and includes 46 tables and 33 figures, and also contains 7 full-page colour plates giving the genetic composition of the Major H-2 haplotypes and the amino-acid sequences of class I and class II Mhc molecules from mouse, rat, rabbit and man with a 12-colour code identifying shared residues, 'ancestral' residues, mouse-rat-specific residues, mouse-, human-, rabbit-, and rat-specific residues, etc.

I hope that these lists will make the reader's mouth water and his eyes glitter with anticipation, rather than sending him off to some other subject. He/she will of course find much else of interest in other chapters: e.g. an illuminating discussion in chapter 7 (Function) of the Holy Trinity of Immunology (APC = antigen-presenting cell, T lymphocyte and B lymphocyte) and their interrelationships. Chapter 8 (Sociology) discusses the many genes either within the Mhc DNA region or very close to it, some of which have been claimed to have functional relationship to the Mhc genes. These include the Complement genes which are located among the Mhc genes, the mouse *t*-complex genes, and a number of enzyme-coding and other loci. Though some of these genes code for cell-surface proteins, there seems to be no convincing evidence that any of them have a functional correlation with Mhc. Chapter 8 discusses the associations, or lack of them, between *HLA* types and both infectious and non-infectious diseases, correlations between haplotype and races, and polymorphism of the mouse *H-2* complex. The last chapter, on Evolution, considers 'Whence the Mhc?', Relatives of the Mhc, Homologies among the Mhc genes, Evolution of Mhc and associated loci, Forces propelling the evolution of Mhc genes, Rate at which Mhc evolution takes place, Chromosome evolution, and finally, The parable of the Blue Chrysanthemum.

I do not think this book will go rapidly out of date, in spite of the intensity of current research, and it certainly deserves to be widely studied. It is written clearly and elegantly, and brings out well the many areas of controversy, uncertainty, ignorance and complete mystery which are still embedded in the Mhc complexity. If a few of these have been solved since the book was written, reading it will help these new discoveries to be put in their proper context. It is a misfortune that, at this time of money shortage in the pocket and in the Library purse, the book cannot be sold more cheaply.

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Electron Microscopy in Molecular Biology: A Practical Approach. Edited by J. SOMMERVILLE and U. SCHEER. Oxford: IRL Press Ltd. 1987. 248 pages. £16.00, US $29.00. ISBN 0 947946 54 3.

This book is primarily addressed to those who wish to obtain visual dimensions of biological macromolecules and macromolecular complexes. Transmission elec-