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REVIEWS

HUMAN CHROMOSOMES. S. Makino. North Holland Publishing Co., Amsterdam and Oxford, 1975. Pp. 600+5 text figures, 152 plate figures. $60.50.

In the preface of his book, Professor Makino states that during the organisation of the latter part of the volume, he was faced with the rapid and surprising development in new staining methods for human chromosomes. Only limited use is therefore made of modern developments derived from studies on chromosomes stained and banded by the new techniques. This is a major criticism of an otherwise comprehensive account of the current state of knowledge in human chromosome research. However, although the majority of karyotypes shown in the illustrations for the book are those stained by conventional techniques, comprehensive coverage of the new banding methods is given in the section dealing with Chromosome Methodology.

After an interesting historical introduction, and sections dealing with Methods and Nomenclature, the greater part of the volume covers the chromosome features of normal and affected states derived in the main from studies on Japanese populations. In this context the book serves the very useful purpose of bringing together a great deal of information gathered by Japanese workers that was not hitherto readily available. In addition to inherited congenital abnormalities, accounts are given of the chromosomal findings in neoplastic, radiation-exposed and virus infected subjects. In particular, the section dealing with irradiation is highly informative, giving a detailed account of the findings from survivors of the Hiroshima and Nagasaki atomic bombings, and from fishermen exposed to fallout irradiation at Bikini.

Overall, the book contains a wealth of information collected by Professor Makino, his students and his many Japanese cytogenetic colleagues, and should serve as a useful source of information for comparisons with data obtained in studies on other racial groups.

ANN C. CHANDLEY
Western General Hospital, Edinburgh

CHROMOSOMES AND CANCER. Edited by James German. John Wiley and Sons, New York, London, Sydney, Toronto, 1974. Pp. 781 (incl. Index). (Volume one of projected " Chromosome " series.) £17·40.

The stated objective of this book has been to include reviews of the major areas investigated in the field of chromosomes and cancer during the fifty years up to " the beginning of the era of cytogenetic banding techniques ". There is no question that those sections dealing with purely descriptive cytogenetics suffer from the paucity of reference to information obtained from chromosome banding. Indeed this shortcoming is highlighted by the single paper (M. W. Shaw and T. R. Chen) dealing specifically with the application of banding techniques to tumour chromosomes.

Having made this criticism it must be emphasised that the title has been very liberally interpreted so that chromosome identification forms only a small part of the content matter. From the introductory chapters—a

biographical note by Curt Stern, an analysis of Boveri's work by Ulrich Wolf and a broad view of the biology of cancer by Burnet—it is clear that the scope includes the whole of cell and molecular genetics as applied to cancer.

The authors, all recognised authorities in their fields, have been at pains to give comprehensive coverage of the relevant literature, often dating back for several decades and, with rare exceptions, give admirably lucid introductions to their subject for the benefit of the non-specialist. At the same time there has been no attempt to suppress controversial views and the contributors have been given a free hand to write in their individual styles. This makes the book lively and some will no doubt find it unexpectedly provocative for a collection of reviews.

This is particularly true of the first two papers (by H. L. K. Whitehouse and Susumo Ohno) in the section entitled " Disturbances of the Genetic Material ". This section also includes a lucid answer to the question " What is a Chromosome Break ", by D. E. Comings and two very comprehensive reviews of virus-induced and radiation-induced chromosome aberrations by D. G. Harnden and H. J. Evans respectively.

The second major section " Cancer as a Clone " comprises a short but wide-ranging paper by P. C. Nowell on the cytogenetic evidence for clonal evolution in a variety of animal and human tumours. The theme is developed with a more detailed analysis of the situation as it applies to myeloid leukaemia in man (J. de Grouchy and C. Turleau) and then the parallel data from the use of biochemical mosaic systems (mainly G6PD) is reviewed by S. M. Gartler. The final paper in this group is devoted to the cytogenetics of canine venereal tumours (S. Makino) and seems rather out of place since the relevance of this condition to other forms of malignancy has yet to be demonstrated, remarkable and interesting though it may be in its own right.

Section three covers the cytogenetics of certain specific cancers. As mentioned earlier, it is this area which appears most " dated " and much of the careful recording of chromosome numbers and the description of " markers " in a variety of human and animal tumours may prove redundant when break points and recombinations have been precisely identified. Nevertheless A. I. Spriggs, S. Muldal and L. G. Lajtha and Joachim Mark provide brief and well-referenced summaries of what has gone before, which will be welcomed by those covering similar ground with more powerful techniques.

The last section, " Special Approaches " comprises those papers which do not fit readily elsewhere. Though heterogeneous, most cover growing points in tumour cytogenetics. O. J. Miller's review of cell hybridisation in the study of the malignant process does not dwell on the technical aspects of this approach but gives an admirably up-to-date overview of its implications. Arthur Bloom, Jeanne A. McNeill and F. T. Nakamura discuss the cytogenetics of established human lymphocyte cell lines without reaching any well-defined conclusions. Links between the molecular basis for disturbances in the genome, as discussed in the first section, and the clinical phenomenon of malignant disease are very clearly developed in two short chapters on Bloom's Syndrome and Ataxia Telangiectasia (James German and D. G. Harnden) and the book concludes with reviews of the cytogenetic and oncogenic effects of radiation exposure in man (A. A. Awa) and of Rous Sarcoma virus in small mammals (Felix Mitelman).

In spite of my introductory criticism and accepting the editor's concern

to record the history of this field, " Chromosomes and Cancer " is fundamentally forward-looking and the last section with its theme of synthesis between theory and clinical practice gives a clear indication of the direction of future developments for which this book will provide a valuable launching platform.

C. M. STEEL
Medical Research Council, Clinical and Population Cytogenetics Unit, Western General Hospital, Edinburgh

MOLECULAR VIROLOGY. T. H. Pennington and D. A. Ritchie. Chapman and Hall, London, 1975. Pp 64+23 figures +tables. £1·30.

This title in the *Outline Studies in Biology* series covers the anatomy, intracellular activities and genetics of viruses from a strictly molecular standpoint. There is also a short final chapter on tumour virology. The chapters on the structure of viruses and the sequence of events following infection, from penetration to lysis, are concisely and authoritatively written. They make absorbing and informative reading. These two chapters include accounts of genome structure, genetic organisation of the genome and nucleic acid replication. The section on genetics concentrates on mutation, the mapping of viral genomes and recombination, but is not nearly so well presented. It does not consider, for instance, the contribution of studies on T4 bacteriophage to our understanding of the fine structure of the gene or the genetic code, except rather obliquely in passing. The problems of mapping are given more extensive coverage but the three quarters of a page on "*functional or complementation analysis*", while throwing in all the key words like *intergenic complementation, intragenic complementation* and *unity of function*, contains barely a word of explanation and will doubtless generate more confusion than clarification. The students' response to this book may well be to read it in the book shop and then put the money saved towards one of the several excellent text books listed in the " suggestions for further reading ".

R. N. JONES
Department of Agricultural Botany, University College of Wales, Aberystwyth

CYTOGENETICS OF MAN AND OTHER ANIMALS. A. McDermott. Chapman and Hall, London, 1975. Pp. 64+60 text figures. £1·30.

This book is one of several in the *Outline Studies in Biology* series edited by J. A. Ashworth. The title is rather pretentious for a book of only 64 pages which, when the space for figures and the 254 references is set aside, reduces to a mere 31 pages of script. Even so the net has been cast really wide to catch undergraduates and graduates in genetics, biology and medicine as well as practising clinicians. The seven chapters of this " concise and comprehensive account of human and animal cytogenetics " provide " a foundation for self help in the achievement of successful examination results " embracing the mechanism of inheritance, advances in techniques, chromosome mutations, cytogenetics in medicine, heterochromatin and evolutionary aspects of chromosomes! Readers will need all the self-help they can get. In the semi-diagrammatic representation of mitosis the prophase chromosomes appear in an unreplicated form and attached to the nuclear membrane at their