Book reviews

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Guidelines for the Testing of Chemicals for Mutagenicity
Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment. DHSS Report on Health and Social Subjects No 24. (Pp 95. £4.50.) London: HMSO. 1981.

Much of the anxiety about the effects of ionising radiation in causing mutation has been replaced by anxiety about the possible effects of chemical exposure in inducing mutation. It is therefore appropriate that the DHSS has produced a Grey Book on the Guidelines for Testing of Chemicals for Mutagenicity. The point is made that mutagenesis and carcinogenesis may originate in similar processes, but it is nevertheless recommended that mutagenic hazards should be considered in their own right.

Four test procedures are considered: firstly for gene mutation in bacteria; secondly for chromosome damage in mammalian cells grown in vitro; thirdly for mutation induced in either mammalian cells or for recessive lethal mutations in Drosophila; and fourthly in vivo tests on a mammal, for example the metaphase analysis of bone marrow or the dominant lethal test in rat or mouse.

The pamphlet contains useful tables of the frequency of chromosomal anomalies, monogenic disorders, and congenital malformations, an extensive bibliography of test procedures for mutagenesis, and a succinct summary of basic genetics for the benefit of lawyers, administrators, and others without biological training who may be concerned with the hazards of exposure to chemical mutagens.

C O CARTER

Genetic Engineering 1
Edited by Robert Williamson. (Pp xi+167; figures + tables. £9.80, $24.00.) London: Academic Press. 1981.

This is the first book in a series of rapidly published reviews on specific aspects of genetic engineering, and if the other books follow the same pattern it is likely to prove a very useful series indeed. My initial reaction to a review series on a subject that is changing so rapidly was that no matter how fast it is published it could not compete with special review issues of weekly journals, such as the issue of *Science* devoted to recombinant DNA. Such special issues probably are the best way to present broad reviews of recent discoveries to a wide audience, but the present book fulfils a rather different function.

There is emphasis on the evaluation of different recombinant DNA techniques, and research strategies are often described in sufficient detail for the reader to understand how particular conclusions were reached. This allows the reader, who is not actually using recombinant DNA techniques but understands the general principles, to have some insight into what sort of problems can be solved by these powerful techniques and perhaps to pose some imaginative new questions from his own field of genetics. It would be wrong to imply that this book is a basic introduction to genetic engineering; the reader needs at least a general knowledge of molecular genetics.

The book consists of three long contributions. J G Williams describes the preparation and screening of a cDNA clone bank, that is, the preparation of bacterial cells transformed by a plasmid containing the DNA copy of an RNA molecule. Like the other contributions, this one ends with a brief look at the future possibilities. The challenge, it seems, is to improve the screening of cDNA or clones so that eventually it will be possible to isolate a sequence from mRNA that represents less than 0·1% of the total mRNA population of the tissue. Many mRNAs of great interest to medical geneticists are in this category.

P F R Little describes the application of restriction enzyme mapping in the prenatal diagnosis of the haemoglobinopathies. He works through several simple mapping experiments that employ the Southern blotting technique. Reliable prenatal diagnosis of a homozygous affected fetus can either be by direct detection of the gene deletion, as in α-thalassaemia, or by demonstrating that the fetus has inherited the same two lengths of DNA containing the gene locus in question as a previously affected family member. The latter approach relies on the existence in the family of polymorphic variation at a endonuclease retriction site and classical linkage analysis.

In discussing linkage analysis, Dr Little rightly distinguishes between those situations where there is extreme linkage disequilibrium, as with the sickle gene and a HpaI restriction site nearby, and those

situations where this is not apparent. However, I think it is most unfortunate that he invents the term 'allele-specific linked polymorphism', when the discipline of genetics already has the more appropriate term of linkage disequilibrium. It is the job of the series editor to ensure that the contributions are appropriately integrated with general biochemistry and genetics, and this includes using the accepted nomenclature. For maximum reliability in prenatal diagnosis using linkage analysis it is important to study additional family members, ideally an affected person, even if one is dealing with an extreme linkage disequilibrium like sickle and the HpaI site; this point should have been emphasised.

The final contribution by M P Wickens and R A Laskey reviews eukaryotic transcription assays, particularly the expression of cloned genes in cell-free systems and in micro-injected Xenopus oocytes. Here again there is a satisfactory combination of methodological details and experimental results which gives the reader a real feel for the exciting new work on gene regulation.

Overall, the book is well set out with lots of sub-headings, useful tables of contents, and diagrams where appropriate. It is well up to date; the last contribution, for example, quotes 29 1980 references and a few 'in press' for 1981. It will be of interest to those who seriously want to learn more about the recombinant DNA revolution.

MARCUS PEMBREY

Dentistry in the Interdisciplinary Treatment of Genetic Diseases

Birth Defects: Original Article Series. Volume XVI, No 5. Edited by Carlos F Salinas and Ronald J Jorgenson. (Pp xvii + 200; figures + tables.) New York: Alan R Liss. 1980.

There is no real need for every geneticist to buy each volume in the Birth Defects: Original Article Series but it is a valuable asset for central medical libraries in each region to have a full series. The latest volume contains the proceedings of a symposium which served as a meeting ground for dentists and geneticists. A good deal of the book explores the role of the dentist in genetic counselling and his relationship with the geneticist in preventing dental disease, especially where more widespread dysmorphic features are present. Above all, the emphasis is on the combined participation of the dentist and geneticist in the craniofacial team. Close collaboration of this nature is rare in this country. Perhaps the established tradition in the USA of the dentist as dysmorphologist has helped the relationship. Many of the papers make interesting but not essential reading. Gorlin writes an entertaining article on perception and Witkop unfolds the history of genetics in dentistry. The chapters the geneticist will most want to refer to are those of Salinas on the objective evaluation of the craniofacies, the chapter on the Birth Defects Information Service by Buyse, and the one on numerical taxonomy by Preus. There is also a useful chapter on diagnostic problems but there are no case reports on individual families with genetic disease.

Perhaps this volume can best be used as a probe (a pertinent word) to identify those dentists who are interested in the syndromes of the head and neck and to persuade them to join the geneticist at a combined and regular dysmorphology meeting.

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