Books and Monographs


During the summers of 1960, 1961, 1962, and 1964 the staff of Professor Hayes' Microbial Genetics Research Unit in Hammersmith organized a four-week course in practical microbial genetics. Places in these courses were eagerly sought after and, though the accommodation was never equal to the demand, the courses undoubtedly did much to disseminate the concepts and techniques of a relatively new and extremely important branch of genetics. Professor Hayes' Unit has now moved to Edinburgh and the summer courses are no longer being given, but the information given in this manual should enable any university department with reasonable facilities and some experience of handling microorganisms to reproduce the experiments. Different sections are devoted to different topics or experimental organisms (mutation, transformation, virulent bacteriophages, conjugation, Aspergillus genetics, and so on), and each section is preceded by a concise introduction giving a minimum amount of background information. The experimental protocols themselves include precise details on quantities and timing. All the contributors were actively concerned in the research which led to the experiments described, and several of them were largely responsible for the major discoveries which form the basis of modern microbial genetics. Furthermore, the experiments have all been tested under class conditions and been found to work, at least with reasonably sophisticated students. This manual can thus be recommended with the utmost confidence, and it should open the door to modern microbial genetics in many laboratories where it has previously been considered too difficult to attempt.

J. R. S. Fincham


The difference between the present book, which appeared in 1968, and its first edition, which appeared in 1958, can be used as a measure of the extensive advances that have been made in the investigation of the haemoglobinopathies. There is an introduction which explains the importance and the nature of the haemoglobinopathies which of course include both those due to abnormal haemoglobins and those arising from the different thalassaemias.

Abnormal haemoglobins are of interest both to the clinical biochemist and the pathologist. It is, therefore, important that for the former there is also some instruction in this book on basic haematological techniques with which the chemist might not be so familiar. These are comprehensive, and admirably done, though perhaps the sickle-cell test (on page 115) is not quite adequately described. It suggests that a fresh solution of sodium 'bisulphite' is prepared and that equal amounts of fresh blood and sodium 'bisulphite' are mixed on a glass slide. The difference between the two compounds may be due to a misprint but one would have expected the concentration to be given, and, in view of the confusion of the nomenclature in this group of chemicals, a statement as to which compound, e.g. Na₂S₂O₄ or Na₂S₂O₃, is actually required. In addition, if the test is only carried out for 15 minutes, there should be no need for sealing with paraffin or Vaseline. This is pointed out here merely because it could be corrected in the next edition, and it would then match the many other admirably composed instructions for simple and far more difficult procedures.

The larger part of the book deals with the identification and detailed description of abnormal haemoglobins and of the different proportions of haemoglobin A₂ and haemoglobin F, as they may be found in thalassaemia and in other haemoglobinopathies. Several electrophoretic procedures are described in detail and sometimes different techniques are given for the same type of electrophoresis, so that the reader can make his choice. There are full descriptions for the techniques for measuring foetal haemoglobin, and for the differentiation between normal and abnormal methaemoglobins by spectroscopic analysis. The chromatography of the haemoglobin variants is thoroughly dealt with, and, for those who want to go further, a considerable part of the book is devoted to the structural analysis of the haemoglobin variants. This involves high voltage electrophoresis of the tryptic peptides and further separation of these tryptic peptides by various means, their specific staining for amino acid residues such as methionine, tryosine etc., and lastly their final analysis by determining the amino acid content and the proportion at which these amino acids are present.

Every chapter in the book contains references so that
the reader is in a position to pursue further points in which he might be specially interested. This book will appeal to a wide variety of readers and certainly to all those interested in medical genetics.

H. LEHMANN


Formerly mental deficiency practice was a placid backwater of psychiatry. Little was known about the causes of mental defect. The majority of cases were labelled primary amnesia, and a single all-purpose gene determining mental deficiency was invoked as the cause.

A remarkable change in our concept of this subject has occurred in recent years. Many different underlying abnormalities have now been identified as producing the symptom of mental retardation. This has not only altered our attitude to the retarded but brought the subject back into the fields of general medicine, paediatrics, and genetics.

The main advances have been in metabolic and chromosomal studies. These subjects are admirably treated in this book which is the result of collaboration and exchange of ideas between a psychiatrist and a clinical pathologist, both consultants to the Stoke Park Hospital Group.

The chapters deal in turn with many disorders of amino acid, lipid, carbohydrate, endocrine, and connective tissue metabolism known to cause brain damage in utero or during the first two years of life. Each of the abnormalities or syndromes is described under clinical findings, mode of inheritance, laboratory findings, and nature of lesion. The often complicated biochemical changes are explained in clear metabolic diagrams and a very full bibliography follows each chapter.

There is a short chapter on chromosomal anomalies and a large section on the many other abnormalities causing mental retardation. The book concludes with a list of 78 syndromes associated with mental defect but of unknown aetiology. Future observation and careful investigation of these syndromes, many of which are rare, will lead to knowledge of their causation and eventually to their prevention.

The book is clearly and concisely written and has been carefully edited and produced. It is essentially a book of reference, being packed with facts, and will surely be welcomed by all those whose work, whether clinical or pathological, confronts them with the manifold aspects of mental retardation.

L. T. HILLIARD


This book presents 'a unified theory of many physiological and pathological phenomena that, hitherto, have not been clearly connected'. The author links 'central growth control, cellular differentiation, immune mechanisms and some forms of genetic polymorphism to those many disease and ageing conditions that contribute to the ill-health, unhappiness and impoverishment of mankind'.

There seem to be two basic elements in Burch's theory. The first derives from work done by Professor Burwell and himself, and from ideas of Sir Macfarlane Burnet. According to Burwell, the function of the lymphoid system is to stimulate mitosis and to control growth by a positive self-recognition mechanism. This involves a two-way flow between the lymphoid tissue and the tissue it controls. This implies mutual recognition based on identity relations between interacting macromolecules which, the author believes, can be explained by London-van der Waals' forces. This seems surprising in that usually these forces are remarkably non-specific, and are not long range in the biological sense even though they are so called for some physical phenomena. His theory then claims that much disease is caused by a breakdown in this two-way flow which results in auto-aggressive (or 'auto-immune' in more general terminology) conditions, and that these are initiated by a small number of random events, namely a special form of somatic mutation in the genes of the lymphoid (or comparable) cells. Ageing, in the main, consists of a very large number of specific auto-aggressive disorders of this type.

The second element of this theory is derived by analogy with radioactivity. The decay of radioactivity in any given mass of radium depends on completely random, disintegrating events in the mass of atoms. The rate of disintegration (or the intensity of the radioactivity) decreases with time according to a particular negative exponential law. He finds a similar relation when he plots the relative age-specific initiation rate of certain diseases, on a logarithmic scale, against the estimated mean age at the initiation of the disease. From this he deduces that the initiation of the disease is caused by random events (in cell nuclei), very much as radioactivity is caused by random disintegrations of atomic nuclei.

The theory is developed carefully and honestly. For example, for this relation it is necessary to determine the age at which the disease was initiated; in fact the available statistics show only the age at which it was diagnosed. Guess-work (or 'trial-and-error procedures') plays no small part in estimating the age at which the disease began, but Dr. Burch makes this clear. And to get all his selected conditions to fit his theory he has to postulate as many as 18 random initiating events for one condition. In his eagerness to generalize his theory he even claims that the first fractures of the forearm are due to somatic mutations: 'Although trauma may often precipitate this type of fracture ... the underlying pathogenesis of the condition is generally auto-aggressive.'

The theory is closely argued, and a considerable weight of evidence is offered in its support, though Dr. Burch admits that, 'unfortunately, the would-be synthesiser is obliged to survey fields in which he has no specialist training, and he cannot always distinguish,