The Assessment of Population Affinities in Man.

This book is the record of a symposium held at Utrecht in 1969 under the auspices of the Human Adaptability Section of the International Biological Programme (IBP) and the Wenner-Gren Foundation. The organizers were fortunate in bringing together many of the world’s leading authorities on population distance statistics and their interpretation, and one of the most valuable features of the meeting must have been the discussions between the leaders of different schools of thought. It is therefore much to be regretted that the book contains no record of these discussions. There is some compensation for this in the fact that the authors, in revising their individual papers, have clearly had access to those of their colleagues, so that there is fairly full cross-referencing between them.

It is no doubt inevitable, but is in some ways unfortunate, that the first few chapters on methods are purely theoretical, as this may discourage the biologist who is not a statistician, but needs to use statistics, from reading on. The later chapters, in which the various methods are applied to observational data, are the ones which will show the persistent reader what the book is all about, and he may then wish to go back to the earlier chapters for fuller accounts and criticisms of the methods used. Perhaps the most useful chapter for such a reader will be that by Hiernaux on ‘The analysis of multivariate biological distances between human populations: principles and application to sub-Saharan Africa’. Being both a practical medical biologist and a competent statistician he has assessed the various distance statistics in a way which, while perhaps less rigorous, will be more understandable to the biologist than the purely mathematical approach of the introduction. Such readers would be well advised to follow up some of his bibliographical references to his own fuller treatments of this subject, one of which is in English.

The various sets of data which are analysed show what a large variety of criteria are now being applied in comparative population studies: blood groups and a wide range of other hereditary blood factors; dermatoglyphics; anatomical measurements; glottochronology. Clearly, however, most of the authors, where they have not exclusively used their own data, have had difficulty in finding comparable populations all of which have been tested for the same set of factors.

Most of the observations used were made before the IBP became fully operative; one of the most valuable features of the latter has been to stimulate the use of uniform sets of genetical and other criteria in population studies, so that it is now becoming possible to compare populations on a much broader basis than it was even as recently as 1969.

The present book is essentially statistical, and while it contains a great deal of new and interesting data, mainly genetical, on a wide variety of populations, it deals only incidentally with their physiological meaning. The IBP has produced a relatively enormous amount of data of a similar kind. These are now being analysed and assessed in terms of human evolution and adaptation to the environment. The IBP itself has not been primarily a medical exercise, but it will now be followed up by new programmes of investigation such as Man and Biology (MAB) and a study of the human response to the urban environment. In these, the environmental and genetical aspects of disease will receive new attention, especially from the population or epidemiological aspect. Here the methods of population study evolved under IBP auspices will have a fresh application, and the present book will be a valuable guide.

A. E. Mourant


A reviewer should be impartial, and I must therefore confess at the outset to being a longstanding Burnet addict. I always await the next Burnet with pleasurable anticipation and have never been disappointed. Burnet is the great theoretician of modern immunology, and he is to immunology what Fred Hoyle is to astronomy. Burnet has always stressed the importance of genetic principles in immunology such that ‘much immunology and many aspect of pathology are concerned basically with the population genetics and dynamics of the circulating cells of the body’.

His recurring theme has been the differentiation between ‘self’ and ‘not self’ and the immunological mechanisms which allow this distinction to be made. These control mechanisms occasionally break down leading to immunological attacks on self components, and hence auto-immune disease has always been one of Burnet’s major interests. This admirable and well produced book surveys the field of auto-immunity including the pathogenesis and clinical features of the main auto-immune diseases, and it also provides valuable summaries of current immunological concepts.

Burnet suggests that auto-immune disease is caused by
the emergence of ‘forbidden clones’ of immunocompetent cells which evade the normal control mechanisms and attack body components. The abnormal stem cells probably arise by a series of somatic mutations, and this therefore puts this important group of diseases fairly and squarely into the genetic camp. It is well established that auto-immune diseases such as SLE, Hashimoto’s disease, and pernicious anaemia have a strong familial incidence, although the precise mode of inheritance is not clear. The genetic predisposition is well substantiated by the remarkable incidence of auto-immune disease in NZB mice. This strain has a 70% incidence of auto-immune haemolytic anaemia and if crossed with NZW mice, the F1 generation has a high incidence of immune-complex renal disease. There is, therefore, no doubt that the predisposition to auto-immune disease is inherited, but precisely what is inherited is unknown.

Genetics has the reputation among some practising clinicians of being unduly concerned with rare, esoteric and untreatable diseases, but if Burnet is right in suggesting that genetic factors including somatic mutation are integral to the development of auto-immune disease, then the relevance of genetics to the practising physician becomes much more important, because auto-immune diseases such as thyrotoxicosis, myxoedema, SLE, Addison’s disease, and rheumatoid arthritis form a large part of routine clinical practice. There is no doubt that modern immunology has added a new dimension to the importance of medical genetics. The traffic has, however, not all been one way, as genetic studies have contributed much to modern immunological theory. A recent and striking example has been the study of the rare genetically determined immunological deficiency syndromes which has led to the delineation of the two major immune systems, namely the T cells responsible for cellular immunity and the B cells responsible for humoral immunity.

Burnet also emphasizes the importance of somatic mutation in other fields. It is suggested that repeated somatic mutations lead to cellular loss and inefficiency and that this may be an important part of the ageing process. Somatic mutation may lead to neoplasia and an important function of the T cell system is immunological surveillance aimed at detecting and destroying potentially dangerous mutants. The exceptionally high incidence of neoplasms in the genetically determined immunological deficiency syndromes provides strong evidence in favour of immunological surveillance as a protection against neoplasia.

My only criticism is emotional rather than intellectual. The acceptance of auto-immune disease as a consequence of somatic mutation holds out little hope of major therapeutic advances. Burnet has previously expressed the opinion that molecular genetics is unlikely to lead to therapeutic advancement. Is modern immunogenetics leading in the same direction, and in Shakespearean terms, is it ‘a tale told by an idiot . . . signifying nothing’? The way out could be that environmental triggers, potentially capable of control, may be partially important in causing somatic mutations.

Immunogenetics in the guise of the blood groups was a pacemaker in the development of human genetics. Burnet has clearly indicated that immunogenetics still has much to accomplish, and may well be the ‘messenger’ which will carry genetics further still into the heart of clinical medicine. This book is certainly stimulating and will surely add new fans to the Burnet Club.

RONALD FINN


Carleton Coon is by reputation one of the most prolific of American anthropologists. His works have included monographs, speculations, controversies, and compilations. Now in retirement, he is continuing his writing habit of a lifetime, his most recent production being ‘The Hunting Peoples’. It is in the style that he employs so well, an overview of diverse peoples having in common survival into the 19th century without agriculture and without domestic animals other than dogs. The material is organized by subjects, each being illustrated by reference to a number of peoples—fishing, travel and transport, government. The book is aimed at the general reader and is probably too elementary, too easy of generalization, to recommend it for use in any university course. For readers of this Journal, it is of peripheral interest in that it illustrates the small population size, different marriage systems, and the variety of conditions of life and hence the potential selective variables that may have influenced the gene pool of these groups; it does not however develop the biological implications of such factors.

D. F. ROBERTS