After an introduction to the symbols used and simple operations with matrices and vectors relevant to distance calculation, the main body of the book falls into three parts. The first deals with distance coefficients calculated from quantitative variables, starting with Czekanowski's 1909 introduction of the mean difference (DD) and the simple derivatives from it, then passing rapidly to methods involving squared differences, the coefficient of racial likeness, Penrose's C^2_H and Mahalanobis's D^2 , and subdivision of D^2 and C^2 into size and shape components. For each of these, examples are worked in full detail, and attention is drawn to the interrelationships between the various methods.

The second main section concerns distance coefficients calculated from qualitative variables. Since these are of rather more recent development, their presentation is not in chronological order, but by type of method. The first category covers coefficients based on squared differences between percentage of frequency values, the second those using the same principle as χ^2 , the third those coefficients by which the differences in percentages between populations are expressed in terms of the elements of the pooled dispersion matrix of all investigated groups (ie, corresponding to the calculation of D^2 for quantitative traits), and the fourth those based on angular transformations of the original percentages of frequencies. The third main part deals with methods of combining quantitative and qualitative variables into a single measure of distance.

This is not an easy book to read. English is clearly not the author's mother language. There is no index. Hierarchical methods would have been a logical inclusion. Academically it is doubtless useful to have the older methods set out so that readers can appreciate why the complexities of the modern methods are necessary. But in these days of modern computers, whereby work can be done in seconds which would have taken years of desk calculation, few will spend time applying these methods step by step, except perhaps in those centres where facilities are limited. But here perhaps is the main value of the book, for recourse to computer analysis should occur only when the methods themselves are appreciated for their merits and demerits, and for this the book is a valuable introduction. It is clearly presented and the examples are worked with thoroughness and accuracy.

D. F. ROBERTS

Human Embryology and Genetics. By F. Beck, D. B. Moffat, and J. B. Lloyd. (Pp. vi + 313; figures + tables. £4.25.) Oxford: Blackwell Scientific. 1973.

In the preface to this book the authors point out that it is intended primarily for undergraduates in the fields of medicine and human biology, and as such it joins a number of competitors covering comparable ground. In general the comparisons are favourable, but the inclusion of many topics has led to them being considered so briefly as to be of limited value.

There is an excellent introduction to human genetics

with a rather condensed account of aspects of nucleic acid biochemistry. It seems likely that this would be amplified by biochemical courses in most medical schools, and for this reason the short section on the biogenesis of gonadal hormones seems superfluous. Contraception is dealt with briefly, and a note on the therapy of infertility is included.

The chapters on conventional embryology are of a high standard, with good line drawings which supplement the text. The notes on malformations of various systems at the end of each chapter are unsatisfactory, in general no idea of the frequency or clinical importance of various defects is given, a defect not repaired in a final chapter on malformations and twinning. The chapter on post-natal development is good and rightly emphasizes this phase of human maturation.

The book is easy to read in its less condensed areas, and is well produced, with excellent cross-referencing. It is a good embryological text with useful information on other aspects of reproductive studies.

C. L. BERRY

Genetic Studies in Mental Subnormality. Part 1: *Familial Idiopathic Severe Subnormality: The Question of a Contribution by X-linked Genes.* By B. C. Clare Davison. Part 2: *The Application of Genetic Principles to Screening for Metabolic Disorders: The Leybourne Grange Survey of Mentally Subnormal Siblings.* By Peter N. Swift, Peter N. Benson, and John D. Studdy. (Pp. x + 82; figures + tables. £2.00; US \$3.35, inc. post.) Ashford, Kent: Headley Bros. for the Royal College of Psychiatrists. 1973.

This monograph is a most valuable study on genetic aspects of mental subnormality. The authors of both parts are to be congratulated on their concrete and biologically sound approach to a subject which is only too frequently treated with lamentable vagueness. It is also comforting to know that a further slice has been cut out of the large amorphous mass of conditions associated with subnormality of unknown origin, and attached to the smaller group with known aetiology and prospects of treatment and prevention.

In the first part, Dr Davison reports on investigations of 141 families in the area of the Oxford Regional Hospital Board. In each of these there were two or more severely defective individuals with an IQ of 50 or less. They were not suffering from any condition of known aetiology associated with subnormality. In 50 of these families males only were affected, in 20 females only, and in 71 both males and females were affected. An analysis of the data from various aspects provides evidence which is compatible with a major contribution by X-linked genes to severe subnormality. It is probable that these genes account for a considerable proportion of the hitherto unexplained excess of males among severely retarded patients. In studying the survey one misses an attempt to classify the cases apparently caused by X-linked genes into entities or groups, according to clinical and other signs. Secondly, the validity of some of the dermatoglyphic arguments could be disputed, but these are both

minor points. Dr Davison's section is concluded by three appendices, containing invaluable records of all case summaries and histories in the first two, with some of the pedigrees in the third.

The second part (21 pages) of the monograph is an aetiological investigation by Drs Swift, Benson, and Studdy of those patients hospitalized in Leybourne Grange Hospital who have an IQ of 50 or less, and at least one sib with an IQ of 60 or less. They found 66 such patients from 30 families and divided them into diagnostic groups of known aetiology, those with similar physical, but no biochemical, abnormalities among the affected sibs, those with no physical or biochemical abnormalities and a group of four families, in each of which a new biochemical error had been found (both the affected sibs in these four families were excreting excessive amounts of tyrosin, beta-alanin, l-methylhistidin, and hydroxylysin, respectively). Column chromatography was employed in the biochemical investigations and the advantage of this technique is discussed. Case histories, listing physical and other abnormalities, are given, thus providing a valuable source of comparison for other workers in the field. The four new amino-acidurias provide scope for the study of treatment and prevention.

This small monograph should be carefully studied by all workers in the field of genetics and mental subnormality and an example taken from the methods and techniques used.

RENATA LAX

Basic Immunogenetics. By H. Hugh Fudenberg, J. R. L. Pink, Daniel P. Stites, and An-Chuan Wang. (Pp. vii + 214; figures + tables. £2.20.) London: Oxford University Press. 1973.

Immunogenetics is a fundamentally important subject for at least two reasons. Firstly, immunology although in a state of near transcendental euphoria, is undoubtedly concerned with some of the most important processes in biology. In addition to resisting the incursions of pathogenic micro-organisms, important roles are claimed in differentiation, in fetal development and in oncology. Secondly, the combination of immunochemistry and formal genetics has already yielded an astonishing variety of information about eukaryotic gene action. Autosomal allelic exclusion and the demonstration that the 'one gene, one polypeptide' rule did not apply in immunoglobulin synthesis are good examples.

The term immunogenetics has been used to include the study of any genetic polymorphism providing immunological methods were used. However, one can distinguish within this definition a much more homogeneous area involving the genetics of immunity, that is the genetics of the immune response and of the structure of immunoglobulins irrespective of whether immunological techniques are used in their elucidation. Professor Fudenberg and his colleagues have produced a remarkable review of a field which incidentally has been greatly enhanced by their own activities. They have

properly concentrated on the genetics of immunity. The book begins with a gentle introduction in the form of a wide ranging essay. Chapter 2 deals with immunoglobulin structure and evolution and provides an adequate background for a remarkably comprehensible discussion of the genetics of immunoglobulin molecules covered in Chapter 3 and of antibody variability covered in Chapter 4. In Chapter 5 the genetics of histocompatibility, a brief review of T and B cells and their interaction, antigen receptors on lymphoid cells, immune deficiency states in man and animals, autoimmunity and lymphoid neoplasias, and finally the genetic control of specific immune response are reviewed in only 27 pages. In Chapter 6 the authors consider human blood groups and to some extent depart from the narrower definition of immunogenetics by including systems which, although they may have been detected by immunological (usually serological) techniques, presumably have, with one or two exceptions, little to do *in vivo* with the immune response. Finally, in three appendices, blood group terminology, standard abbreviations for immunological terms (immunology must be 'Top of the Pops' so far as jargon goes) and a list of methods for detecting antibody (with an indication of sensitivity) are given.

This book can be highly recommended not only 'for the graduate and medical student with a fair knowledge of biochemistry and genetics' as the authors modestly put it, but also for more advanced workers, including physicians, who want an up-to-date, brief, and understandable overview of this rapidly advancing and still slightly anarchic field.

R. HARRIS

Birth Defects: Original Article Series, 8, Pt. 15, No.

5. Fourth Conference on The Clinical Delineation of Birth Defects, 'The Cardiovascular System'. (Pp. 325; figures + tables. £13.00; US \$29.00.) Baltimore: Williams and Wilkins; Edinburgh: Churchill Livingstone, 1972.

The value of this series of publications in enhancing medical communication in the birth defects field has been proven many times over. The present volume should be stimulating for all concerned with the diagnosis, treatment, and counselling of congenital heart disorders.

Several articles are of outstanding interest. Dr van Praagh's segmental approach to the diagnosis of congenital heart disease does indeed simplify the seemingly unlimited types of cardiac malformation. Dr Mitchell writes interestingly of her large prospective study of over 50,000 pregnant women with regard to risk factors in the mother and cardiovascular malformations in the infant. Mothers with congenital heart disease themselves have the greatest risk of producing a baby with congenital heart disease, mothers with diabetes have the second highest risk and their babies are apt to have defects of the great vessels, while mothers producing babies with transposition of the great vessels often have an unusual history of oestrogen deficiency. Increased maternal age also