experts from all over the world met to discuss these problems, compare notes, and present cases. The result is a book profusely and beautifully illustrated, which unquestionably contains the most up-to-date clinical information available. It is difficult to single out individual contributions, but there is a thorough discussion of the achondroplasia-like syndromes, now split into many distinct entities, as well as other dwarfing conditions only recently described. The mucopolysaccharidoses are also discussed fully, both clinically and biochemically and in relation to fibroblast culture work. Where the genetics of these dysplasias are known they appear all to be of the single mutant gene variety. Though, since many of the disorders are extremely rare only single kindreds are described and many cases are sporadic.

The value of this conference lies in the gathering of information from all over the world in order that distinct entities can be clinically identified and some progress made in determining their mode of inheritance and specific biochemical defects. It is an outstanding record of knowledge in this difficult field, chiefly of interest to clinical geneticists, paediatricians, orthopaedic and plastic, surgeons and radiologists. It is to be hoped there will be further conferences arranged along similar lines.

RUTH WYNNE-DAVIES

The Post-natal Development of Phenotype. (Proceedings of a Symposium held in Liblice, near Prague, Czechoslovakia, 18–22 September, 1967.) Edited by S. Kazda and V. H. Denenberg. (Pp. 420; figures + tables. £8.) Academia (Prague). London: Butterworth. 1970.

The title of this volume, the result of a symposium organized by the Czechoslovak Academy is somewhat misleading; it is not concerned with phenotypes as they develop on the basis of segregating genotypes, but rather with the average physiological and behavioural aspects of the development of genetically non-defined individuals with particular emphasis on 'critical periods' and their manipulation.

Of the 32 contributions only 2 deal with man, one with the neuro-integrative development of children of school age, the other with the relation between the suckling period and later development. The other contributions are descriptions or summaries of a great variety of experiments on mice, rats, rabbits, pigs, dogs, or monkeys. The nearest any of these comes to genetics is the first paper by Scott, which deals with 'The critical periods for the development of social behaviour in dogs' and touches on some differences between different breeds. There is hardly any mention of pathological or deviant 'phenotypes' whether in animals or man. This book is well produced and reasonably indexed.

H. KALMUS

Genetic Epistemology. By Jean Piaget. Translated from the French by Eleanor Duckworth. (Pp. 84.) New York: Columbia University Press. 1970.

One of the occasional pleasures of reviewing books chosen by computerized lists is that due to errors, one may read a book about another subject. 'Genetic epistemology' has nothing to do with genetics, but is, in its literal sense, a child's guide to knowledge, in which Piaget summarizes part of his life's work in asking children questions which some philosophers have made incomprehensible, especially to themselves, and in attempting a scientific study of philosophical assertions by assuming some phylogenetic and ontogenetic equivalence in the genesis of thought. This approach is strangely lacking among the great British empiricists who modestly regarded their own endowments as typical. In some ways his approach is complementary to the problems of communicating with automata.

Piaget casually dismisses the claims of many of those who labour to spin new clothes for their emperors. Even Whitehead and Russell are challenged on their definition of numbers as classes, on the apparently incontrovertible ground that children can define numerical equality without explicit pairing.

Children, to Piaget, are strangely uniform and there is little here of aberrant, or of exceptional, responses; the linguistic arguments are restricted to Indo-European languages, and the author does not venture into the strange worlds of the deaf or the blind.

The book is translated, but the publishers were unable to provide an original which is hard on the reviewer, and may be hard on the author.

J. H. EDWARDS

Advances in Twin Studies. (Proceedings of the 1st International Symposium on Twin Studies, Rome, 4–7 September 1969. *Acta Genet. med. (Roma)*, 19, Nos. 1–2.) Edited by P. Parisi. (Pp. xvi+381; figures+tables.) Rome: Acta Geneticae Medicae et Gemellologiae. 1970.

This volume reports the Proceedings of the First International Symposium on Twin Studies held in Rome in September 1969. There are 102 papers: 65 in English, 26 in Italian, 10 in French, and one in German; the papers in foreign languages are not summarized in English. The subjects covered include the epidemiology of twinning as well as the use of twins in genetic studies, though most of the papers are concerned with the latter field. The standard of the papers is very variable. Many are merely summaries of work published in full elsewhere, or preliminary reports on work in progress; some of the other papers are very thin. There is only room here to single out one or two of the more interesting papers for special mention.

Nylander reports data on the inheritance of dizygotic twinning in western Nigeria, which is of great interest both because of the high twinning rate in that region, and because the practice of polygamy provides an opportunity of separating paternal and maternal factors; the same author also reports on the placentation of Nigerian twins.

Among the twin studies on the heritability of normal and pathological characters, there is an interesting

account of coronary occlusion in twins by Harvald and Hauge, who use the data of the Danish Twin Register and show that the occurrence of fatal coronary occlusion is genetically determined only to a very small degree in males, but to a much larger degree in females, because environmental factors known to influence its occurrence are more or less restricted to the male sex. In consequence only females who are heavily genetically predisposed will be affected, whereas environmental factors predominate in males.

Other interesting studies concern the heritability of the activity of serum enzymes, thyroid hormone level and measures of physical performance; it is surprising, however, that most of the authors use Holinger's measure of 'heritability' which does not measure heritability in either of the senses which are used by geneticists today.

M. G. BULMER

Klassische und Molekulare Genetik. 2nd ed. By C. Bresch and R. Hausman. (Pp. vii + 373; 16 plates + illustrations + tables. DM 38.00; \$10.50.) Berlin, Heidelberg, and New York: Springer Verlag. 1970.

The first edition of this book appeared in 1963 and proved an excellent, concise, and clear guide to present day genetics. Reprints in German and translations into Spanish, Italian, and Bulgarian testify to its worth. The frontispiece shows Mendel and Avery: a juxtaposition that summarizes the approach of this volume.

Intended as an introduction not only for students of biology, but also for the increasing number of disciplines which now draw on genetics, the text roams widely over many specialities, but adheres rigidly to its plan of giving the experimental data on which the generalizations are based. Logical deductions are most emphasized, whilst difficult and unsolved problems are indicated. The first 5 of the 12 chapters in this book deal with the cytological basis of heredity, and the succeeding 5 chapters with molecular aspects including an excellent account of enzyme systems and their bearing on regulatory mechanisms. The text is well rounded off by the two concluding chapters; one dealing with secondary gene effects and the other with the broad aspects of human genetics. Selective references—mercifully few in number—are as helpful as the text itself.

ARNOLD SORSBY

Genetic Counselling. By A. C. Stevenson and B. C. Davison. (Pp. vii + 355; figures + tables. £2.75.) London: William Heinemann. 1970.

This book is written to help clinicians who are consulted by patients on genetic risks to their families, and to indicate to clinicians where it is appropriate to seek specialist genetic opinion. The authors adopt the traditional British viewpoint that decision rests with parents and that 'genetic counselling' consists of giving information on risks and not in giving advice. They

also rightly believe that it is useful, as far as it is possible, to give an actual risk figure—a best estimate—rather than just say that the risk is high or low.

In the chapter on elementary genetics the authors sensibly use the terms dominant and recessive for genes as well as traits. This chapter includes a section on multifactorial threshold models, too often omitted from elementary books on human genetics, but the clue to a first understanding of the genetics of most common conditions. They make the point however that estimates from multifactorial models are no substitute for empirical risk figures. In deriving estimates of risks for single gene traits the authors make much use of algebra. This is neat and saves space but many non-mathematically minded clinicians will find the concepts difficult. It is perhaps because of this that the authors give no less than 20 pages of calculations in relation to examples of X-linked conditions, and a further 10 pages in an appendix.

In the middle chapters the authors go systematically through the genetically and partly genetically determined disorders of the different bodily systems. Here an enormous amount of ground is covered. Inevitably individual human geneticists will have knowledge of special fields not available to the authors and will disagree about specific points. Several entities mentioned need further splitting into genetic types, for example the multiple epiphyseal and craniometaphyseal dysplasias. In contrast the reviewer has not seen or read a convincing report of a case of true achondroplasia that was recessive and so would not agree that 1 in 10 are recessive forms. Overall, however, the survey appears remarkably complete and accurate.

The authors include a valuable chapter on disorders and events in pregnancy, such as exposure to radiation. These are not strictly genetic, but are problems which are often raised in a genetic clinic. It is interesting that the authors recommend a termination of pregnancy if the fetus has received 25 rad or more between the third and eighth week after conception. In contrast the risk of leukaemia from intrauterine exposure from the third month of pregnancy onward are not more than double for each rad of exposure.

C. O. CARTER

Human Genetics and Medicine. (Studies in Biology no. 20). By Cyril A. Clarke. (Pp. vi + 74; figures + tables. £0.75; paperback £0.45.) London: Edward Arnold. 1970.

This book is directed primarily at the science sixth form schoolboy in order to show him that medical genetics provides many intriguing intellectual problems and now holds the key to the understanding of most common diseases. The topics Professor Clarke has chosen are therefore 'good stories' and they are well told. They include the controversy between the adherents of a monogenic and a polygenic inheritance for essential hypertension; the problem of maintenance of genetic polymorphism at blood type loci; the beginnings of the mapping of the autosomes; the striking examples of