

reproduction. If these maintain the standard set by the first three, the series deserves to be very successful, particularly in the paperback edition.

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THE ASSESSMENT OF POPULATION AFFINITIES IN MAN. Edited by J. S. Weiner and J. Huizinga. Clarendon Press, Oxford, 1972. Pp. 224. £6.00.

This book contains this contribution to a symposium organised by the Wenner-Gren Foundation and the International Biological Program. It was intended to stimulate consideration of the statistical techniques for analysis of population data of the kind being collected by the I.B.P. on human populations. In this the symposium has well fulfilled its aim, because the contributions in this volume give a broad and reasonably complete cover of the techniques at present available, together with illustrations.

Many of the contributions illuminate old problems or reveal new ones. Gower notes the danger of accepting correlations between different statistics at their face value, and suggests better ways of investigation. Spuhler's comparison of glottochronology with other evidence suggests that the linguists have not yet found the appropriate techniques for analysis of languages. Malyutov and his colleagues introduce population sizes into methods for phylogenetic study, although they also show that population sizes in the past can be critical as well as difficult to estimate. Hiernaux has begun to estimate the magnitude of environmental factors on anthropometric measures of similarity. Many other instructive examples could be cited.

Much of the interest of the illustrations comes from the comparison of similarities based on one class of data with those based on another. It is therefore, despite useful comments by several contributors, a pity that more attention was not given to ways of measuring congruence between data sets. But this will be a good subject for another symposium. The book is well-produced and the contributions are commendably easy to read.

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GENETICS AND EDUCATION. A. R. Jensen. Methuen. Pp. 379. £3.50.

The book is prefaced by Jensen's view of the events surrounding the publication of his Harvard Educational Review article "How much can we boost I.Q. and scholastic achievement?" The emotion accompanying the subsequent debate can be attributed only to a loss of nerve among some of those whose fundamental principles were so rudely shaken by Jensen's observations. For those who believe in "scientific detachment" the preface is salutary reading.

The preface accounts for most of the new material in a collection of annotated papers which is justified by the publishers' desire to make the HER article available to a wider audience. This paper is unparalleled in breadth

and lucidity as a review of the genetical and environmental determinants and correlates of intelligence. The article has been widely discussed and it would be redundant to do more than commend it as a useful summary of the evidence relating to the genetical determination of individual differences in intelligence and as a source of data and hypotheses relating to differences between races and social classes.

Jensen's paper "A theory of primary and secondary familial mental retardation" is no less impressive. It clearly illustrates the author's ability to integrate results from many sources into a valuable theoretical framework. The focal point of his argument is the observation that mentally retarded individuals from the lower socio-economic status (SES) groups are often socially more competent than individuals of the same I.Q. drawn from middle and upper SES groups. Jensen theorises that two levels of ability are involved in the processing and organisation of information. Level I reflects the basic process of information storage and recall, and Level II reflects the more complex processes of integrating and abstracting information. The two faculties, for most purposes, can be regarded as controlled by different polygenic systems but there exists between them a hierarchical functional dependence so that retardation at Level I will necessarily affect performance at Level II, but retardation at Level II can be associated with perfectly normal performance at Level I. The recognition of the distinction between primary and secondary familial mental retardation is held by Jensen to be educationally important since individuals who suffer from secondary retardation could still learn quite adequately and become socially competent if their teachers did not rely on, and look for, the abstractive ability which is associated with Level II functions.

The four shorter papers make a less significant contribution. The "Estimation of the limits of heritability of traits by comparison of monozygotic and dizygotic twins" is now more of a relic than an active force in behaviour genetics. The complexity of the author's footnotes may lead the reader to suspect that the floodgates have subsequently opened and a serious work of repair is under way. The paper, however, highlights the limitations of twin studies when many researchers in human behaviour are still confused about the meaning and estimation of "heritability". The data analyses reported in "I.Q.'s of identical twins reared apart" confirm the magnitude of the heritable component of variation in intelligence and show that one systematic form of interaction between genotype and environment is not important. His paper on "The ethical issues" contributes little to ethics apart from a recognition that scientific findings may be used for good or ill. The collection concludes with a "Note on why genetic correlations are not squared" something about which, according to Jensen, "Psychologists are often puzzled and confused".

No one who reads Jensen's papers can fail to recognise a facility with the literature which is shared by few of his critics, but I had a number of reservations about the contents and tone of the book as a whole. The first was a hope that future work in this field would escape from its historical imprisonment in the correlation coefficient. The reduction of data on relatives and races to tables of correlation coefficients rather than analyses of variance involves a standardisation which often superimposes a spurious tidiness on aberrant data, and which may well obscure important facets of the genetical picture. Secondly, the emphasis on estimates of heritability will certainly be

uninspiring to geneticists and may leave psychologists wondering whether genetics contributes anything really useful to the understanding of behaviour. Finally, I was disturbed by the impression that, whatever Jensen may say to the contrary, he still believes that generalisations from conclusions within populations to the differences between populations are helpful and justified. He alludes twice, in footnotes to unpublished algebra which is claimed to show an monotonic increasing relationship between the heritabilities of a trait "within" and "between" populations. For analytical purposes this can be little more than wishful thinking. Nowhere does Jensen specify the very restrictive genetical and environmental assumptions upon which the model is based. We may conceive, with equal justification, of models which would predict the reverse relationship, and indeed, the real world may behave as if there were no relationship at all. Since there are no means for discriminating between such models at the moment the choice still remains a matter of opinion rather than knowledge.

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CHROMOSOMES TODAY, Vol. 3. Edited by C. D. Darlington and K. R. Lewis. Longman, 1972. Pp. 320; plates, 36; figs, 105; tables, 62. Price not given.

This volume gives an account of the proceedings of the third Oxford Chromosome Conference held in 1970. There is an opening address on the "Future of the Chromosomes" by Professor Darlington, and this is followed by thirty-three contributed papers arranged in three sections—Chromosome Structure and Synthesis, Chromosome Mechanics and Mutation and Chromosomes in Natural Populations. At the beginning of the book is a useful list of names and addresses of all the Conference Members and at the end there are abstracts of all the papers and of the demonstrations given at the Conference.

Papers in the first section are largely concerned with work resulting from the use of cytochemical and autoradiographic techniques. Nagl, for example, presents a thorough analysis of molecular and structural aspects of the endomitotic chromosome cycle in Angiosperms. This is followed by a paper on the mitotic cycle proper (Evans, Rees, Snell and Sun), which reports the results of a wide survey of mitotic cycle times in monocotyledons and dicotyledons. One of the interesting findings is that for comparable amounts of DNA the duration of the cycle differs between monocotyledons and dicotyledons. Pardue and Gall are responsible for an excellent contribution on "chromosome structure studied by nucleic acid hybridisation in cytological preparations".

Section two contains an assemblage of papers ranging over the problems of chromosome movement, pairing, and breakage. The paper by Bajer on anaphase chromosome movements in *Haemanthus* is particularly interesting. The work described combined electron microscopy, phase contrast observations of dividing cells using time lapse photography and microslit U.V. irradiation of the spindle. Clowes' autoradiographic analysis of the cell cycles of different cell types in the meristems of *Zea mays* should be compulsory reading for anyone engaged in the determination of the duration of mitotic cycles in plants. There are a number of papers dealing with radiation induced breakage. The one by Savage indicating preferential chromosome