currently threatening (with superficially philanthropic motives) the principle of detachment and objectivity that is one of the corner-stones of the scientific tower. Unfortunately, whatever personal involvement may be detectable in this statement itself is also, in the strict sense, political and not necessarily appropriate in a presumably scientific review.

There are two justifications for making the detailed and expensive population studies described—one is the hope of interpreting the data now, the other is the hope of interpreting them at some time in the future when the data themselves could no longer be collected. As there is likely to be continued evolution of language and of modes of scientific thought, the time of optimal usefulness of such data may not be far in the future—perhaps only a generation. Beyond that time the odds are that the questions being asked of the data will be of such an unexpected form that they can only be answered satisfactorily by data collections addressed to those particular questions. The present collection would then be of marginal value only. There is admittedly so much uncertainty about the future course of human evolutionary theory that a dogmatic assessment of the value or otherwise of this type of contingency data collection would be hazardous. Further, the practicalities place such severe limitations on the quality and type of information that can be garnered that criticism would be presumptuous. All would agree however that a genius would be welcome who would pose answerable questions having some general relevance and preferably requiring only simple measurements for their answering.

Many of the writers, notably Neel and Morton, have considerable insight into the order of complexity into which they have stepped. Only posterity will know whether to assess these pioneering efforts as courageous or foolhardy. Meanwhile, the book makes interesting if exasperatingly inconclusive reading.

Part of the genetic work is aimed at describing the genetic structures of S. American populations. Sometimes this is here done algebraically in terms of simplified models, and tentative steps are made towards estimating some of the parameters in those models. Other authors describe the present variation in genotype frequencies at polymorphic loci and this presumably reflects the genetic structure as well as selection and other factors. There is a long way to go before these observations and others to come can be reconciled to one model of human evolution and used to estimate its parameters. The genetic aspects considered can perhaps be indicated best by listing some of the authors—Frota-Pessoa, Freire-Maia, Morton, Coope and D. F. Roberts, Ainsworth Harrison, Arends, Neel, Cabannes, Layrisse, Salzano himself and Lisker. There are good indices of subjects, authors and populations.

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NATURAL SELECTION IN HUMAN POPULATIONS. Carl Jay Bajema (Ed.). John Wiley and Sons Inc., New York, London, Sydney and Toronto. Full bound, £4.75; Paperback, £2.25.

The search for evidence of selective effects in relation to genetic differences can be approached in a variety of ways. Indirect evidence can, for example,

be obtained from data indicating directed changes in gene frequency, and from comparisons of the relative variability of polymorphisms in different major population groups. Direct evidence can be obtained by correlating particular attributes, whether simple or complex, with differences in fertility, in survival value, or more generally in intrinsic rate of population increase. The difficulties with the more direct approaches are that they generally require very large bodies of data to provide convincingly significant results, unless the selective effects are substantial. The proper assessment of selective effects using the direct approach requires detailed demographic data. Human populations may, from this point of view, be particularly suited to studies on selection, because the relevant information is often collected in great detail, and is more readily available than in other species.

This volume, produced in part to commemorate the centenary of the publication of Darwin's *Descent of Man and Selection in Relation to Sex*, is an annotated collection of papers on various aspects of natural selection in human populations. The papers concern themselves almost exclusively with the direct approach to the measurement of natural selection. The collection follows the now familiar pattern of reprinting previously published papers. These are organised into groups according to subject matter, and each group is preceded by a short introduction written by Bajema, coupled with some further bibliography. The papers have all been reset, rather than copied directly in their original format, which contributes to giving the volume a more authentic air as a coherent book rather than just a collection of papers.

The first, introductory, section has papers by Dobzhansky, who discusses some general questions of natural selection in man, by Kirk, who reviews the descriptive demography of the United States, and by Howard Newcombe who illustrates the application of record linking using data from fairly large-scale surveys in studies of mutation rates. The second section is concerned with selection in relation to physical characteristics, by which is meant morphometric characters such as height and weight. Three of the papers deal directly with correlations between height, weight, cephalic index and other quantitative measures, and fertility, and with the problem of measuring selective intensity in relation to quantitative characters. Penrose, in his Darwin Lecture, reviews patterns of selection in relation to various types of genetic characters and Hulse tries to explain changes in the relative numbers of different racial stocks in terms of the interaction between culture and nature. The third section deals with selective differences associated with specific genetically determined traits. This includes Vogel and co-workers' assessment of the correlation between ABO bloodtype and smallpox epidemics; Allison's review, in 1964, of selection in relation to a variety of polymorphisms, notably reviewing his own and others' work on the sickle trait and malaria; and a paper by Knudson and co-workers describing the increased fertility of sibships from which parents of children with cystic fibrosis are drawn. The next section deals with selection in relation to behavioural characteristics. This includes Reed and Neel's extensive study of Huntingdon's chorea, which is still the most complete study on selection in relation to a genetic trait, taking account of age-specific birth and death rates. This is followed by Erlenmeyer-Kimling and Paradowski's provocative paper on the reduced fitness of schizophrenics, coupled with a possible increase in fitness of their sibs. In this section we also find Bajema's classic

study on fitness as a function of I.Q., which put paid to the simple widely-quoted concept of an inverse relationship between fitness and intelligence, and a comprehensive review of the population dynamics of Tay-Sachs disease. The last section of the book contains papers which try to look into the future. It starts off with Medawar asking whether medical advances may be expected to lead to genetic deterioration. In his view the simple answer is "No". On the contrary they provide more scope for taking advantage of existing genetic variability in other directions. Crow reviews data on rates of evolution and the effects of demographic changes in the potential for selection in human populations, as measured by his well-known index. He also shows how slow are genetic changes for specific simply determined abnormalities following their cure. Hardin's now classical paper on the tragedy of the commons is also included in this section. This presents in an elegant and forceful way, in connection with the problem of population increase, the conflict created by behaviour which benefits the individual but not necessarily society as a whole. The last two papers by Osborne and Muller represent essentially a plea for the application of eugenic principles to man. Muller was, of course, well known for his stand on these issues and for his advocacy of artificial insemination using sperm from highly selected donors.

Publishing collections of papers is now a fairly popular enterprise and is undoubtedly a simpler way to produce a book than writing it all oneself. With the advent of rapid and convenient copying devices one might have thought that annotated lists of references could serve pretty much the same purpose. Nevertheless, this is an interesting and valuable collection of papers which are usefully gathered together under one cover. The decision will presumably rest with teacher and student as to whether they prefer their papers served up in this admittedly convenient format, rather than extracted from the various original journals.

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BOOKS RECEIVED

- TEXTBOOK OF HUMAN GENETICS. Max Levitan and Ashley Montagu. Oxford U.P., 1972. Pp. 922. £5.00.
 PSYCHOLOGY AND VISUAL AESTHETICS. R. W. Pickford. Hutchinson Educational, 1972. Pp. 270. £4.50.
 THE ASSESSMENT OF POPULATION AFFINITIES IN MAN. J. S. Weiner and J. Huizinga. Oxford U.P., 1972. Pp. 224. £6.00.
 ANAIS DA ESCOLA SUPERIOR DE MEDICINA VETERINARIA, Vol. XI. Pp. 172. Lisboa, 1969.
 THE FIRST TWENTY YEARS OF MARTONVASAR. Sandor Rajki. Agricultural Research Institute of the Hungarian Academy of Sciences, 1971. Pp. 329.
 HEREDITY AND DEVELOPMENT, 2nd edn. J. A. Moore. Oxford U.P., 1972. Pp. 292. £1.40.
 NATURAL SELECTION IN HUMAN POPULATIONS. Carl Jay Bajema. John Wiley and Sons Inc., New York. Pp. 406. Full bound, £4.75; Paperback, £2.25.
 THE BIOLOGY OF AFFLUENCE. George Smith and John C. Smith. Oliver and Boyd. Pp. xii + 126.
 THE SCIENCE OF GENETICS. George W. Burns. MacMillan Co., New York. Pp. 470. £4.85.
 HEREDITY AND DEVELOPMENT, 2nd edn. J. A. Moore. Oxford University Press. Pp. 292.
 READINGS IN HEREDITY AND DEVELOPMENT. J. A. Moore. Oxford University Press. Pp. 329.