

## REVIEWS

SYMPOSIA ON QUANTITATIVE BIOLOGY. Cold Spring Harbor Symposia on Quantitative Biology, vol. XXIX (1964). Cold Spring Harbor, Long Island, New York. pp. 1-492+XIV.

The proceedings of too many symposia are published in book form. Such publications are dull and uninformative in the main since many people will accept a request to give a paper even if they have nothing they particularly wish to say at that time. In the past, the Cold Spring Harbor Symposia have been notable exceptions. The number of speakers has been severely curtailed and in general the organisers have been careful to invite only those who have something relevant to contribute.

However, recent symposia have shown a significant and positive regression of speakers on years ( $b = 3$ ). The data suggest that this is not linear, but that there has been a sharp change in policy between 1959 and 1960. The quality of the papers given is more difficult to quantify but in the reviewer's opinion the increase in number has not been matched by a corresponding increase in first class papers. This is particularly noticeable in the volume under review.

The symposium, like Gaul, is divided into three parts—population studies, genetics of somatic cells and cells in cultures and human proteins. The papers on population studies cover a very wide field. They start with an attempt to construct an evolutionary tree for 15 "populations" of man by assuming that the blood groups are either neutral in selective value or that selection is random in direction and end with a paper on polymorphisms and natural selection in human populations. In between these two there are papers on subjects including mutation load, retrieval of information from records, pleiotropy, breeding systems, the effects of genetic drift and the effective size of primitive human populations. One of the most interesting but frustrating papers is on genetic studies of north-eastern Brazil. This survey is likely to yield much of value, but as the author points out time and time again much of the data had not been analysed when the paper was given! The construction of a human evolutionary tree produced the not very novel result that populations geographically close to one another tend to be genetically rather similar. The study not only explicitly ignored the possibility of convergent evolution as the result of natural selection, but also did not take into account many of the blood group allelomorphs, as for example  $F_y$ , which show striking dissimilarities in gene frequencies between ethnic groups. What is interesting is the conclusion that the observed variance in gene frequencies could be accounted for by genetic drift in effective population sizes of the order of 10,000. Since effective population sizes, even taking into account migration, seem likely to have been smaller than this the result seems to indicate the action of some stabilising selection, as has been postulated for more than 20 years. An estimated effective population size of 10,000 contrasts markedly with the picture of sizes of the order of a few dozen postulated in a paper on factors governing the genetics of primitive populations. However, since this paper was based largely on anecdotal evidence and the incidence of diseases not known to be genetically controlled, it contributes little to the serious study of human populations.

The section on somatic cells and cells in culture is in some ways the least interesting. This is partly because attempts to apply the techniques of microbial genetics to human cell cultures have met with very little success. The papers concerned with these techniques leave the impression that there are three main stumbling blocks:

1. The cells are diploid.
2. No effective gene exchange between nuclei has been produced.
3. Selective techniques for most mutants are non-existent.

There is an added complication that cells in culture often tend to become heteroploid. Several papers in this section discussed the phenotyping of specific mutations in cell cultures derived from homozygotes and heterozygotes. Special techniques for the selection of mutations in cell cultures were described—the most promising of which concerns transplantation antigens in the mouse. In this section there was also an important paper on a new leucocyte antigen system in man which described a methodology which will be of great interest to others in this field.

Perhaps the last section on human proteins will be of most value to the many geneticists who are not themselves protein chemists. Of the 18 papers in this section several are of outstanding interest. The controversy over the control of hæmoglobin synthesis, revealed by the opposing views in papers on the subject, may when it is finally resolved tell us something about the nature of dominance, as well as the regulation of protein synthesis in general. In this section there are also important papers on the genetics of variants in human globulins and on enzyme deficiencies. In one paper the interesting suggestion is made that some of the polymorphic protein variants found in man may arise repeatedly by unequal homologous crossing-over after a gene duplication has been established in the population.

It is almost impossible to review either adequately or fairly a symposium of this size covering such a variety of topics. Few geneticists have an adequate knowledge to do so and few journals can spare the required space. The symposium is not on human genetics in general but only on certain very specialised aspects of the subject so that the volume is not suitable as a general review of human genetics. This book will be of great use as a reference volume for a wide variety of subjects in human genetics. However, if the number of papers had been reduced by about a third and the discussion, apparently drastically edited, had been eliminated, the book would have been equally useful for reference and much more readable.

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**AFRICAN ECOLOGY AND HUMAN EVOLUTION.** Edited by F. Clark Howell and François Bourlière. London: Methuen (1964).

That man is descended from some Primate form which if alive today would be classified with the monkeys and apes, is a thesis which few—lay or professional—would now dispute. That the precise anatomical nature of this extinct creature—the “missing link” of popular literature—is certainly known is an impression that a casual reader could be pardoned for gaining. For the announcement of practically every new find of fossilised higher Primates as a stage intermediate between man and the apes or alternatively as an early member of the human line of descent is a procedure now still as