

most individuals to adjust themselves to changing environmental circumstances. By learning to control both the environment in which he lives, and the influence of the environment on himself, man has created an unparalleled change in the course of Nature.

"This was the law of the Yukon,  
that only the strong shall thrive,  
That surely the weak shall perish  
and only the fit survive".

While this shift in the principles and practice of adaptation to the environment becomes abundantly clear as one peruses this volume, there is, wisely perhaps, no direct comment on it, still less any speculation on its possible consequences.

The *Handbook of Physiology* is described as a "critical, comprehensive presentation of physiological knowledge and concepts". It is unlikely that any other volume of the *Handbook* will attempt to do just this for so vast and relatively unexplored a field, but this aspiration is largely achieved. One can only express admiration for a remarkable compilation. The contributors, in general, are quick to point out the inadequacy of their knowledge, and the young research worker who has not yet been persuaded to direct his whole attention to a more confined aspect of biological function will find the inspiration here for studies which could fill many lifetimes.

Each contributor has been given ample space to state his thesis, and the volume avoids that brittle economy of words which sometimes mars the pleasure of reading scientific literature. There are repetitions, here and there, of matters already discussed by earlier contributors, but no one should cavil at this since sections are referred to in isolation from each other. Each chapter should be, and is, self-contained.

Whatever the policy may be for other volumes in this series, this particular volume should be within the reach of every teacher and research worker in the field of biology.

J. BLIGH

## HUMAN GENETICS AND CYTOLOGY

### Les Chromosomes Humains

(Caryotype Normal et Variations Pathologiques.) Par Prof. Raymond Turpin et Prof. Jérôme Lejeune. Pp. viii + 535. (Paris: Gauthier-Villars, 1965.) 54 francs.

### Human Genetics

Cold Spring Harbor Symposia on Quantitative Biology, Vol. XXIX. Pp. xiv + 492. (Cold Spring Harbor, L.I., New York: The Laboratory, 1965.) 15.00 dollars.

A JOINT review of these two recent volumes can be justified by considering them as complementary. Both publications are mainly summaries of the work of many research workers during the past five years, but the book by Turpin and Lejeune, having only one additional contributor and a single subject-matter, the chromosomes, is more homogeneous and rounded in presentation than the symposium volume which contains 44 separate contributions by different authors.

*Les Chromosomes Humains* starts with a history of our knowledge of the human chromosomes, touches on the techniques for their investigation and then describes the normal human karyotypes. Three chapters deal with the numerical anomalies of autosomes and one chapter with the anomalies of their structure, followed by a chapter on chromosomal studies in leukaemias and cancer. Three further chapters are devoted to the numerical and structural aberrations of the sex chromosomes, and one is concerned with hermaphroditism and pseudo-hermaphroditism. Chromosome differences between twins and the mechanisms and effects of abnormal sex chromosomes are also separately treated. Finally some biochemical pecu-

liarities which are associated with chromosomal abnormalities are discussed by H. Jerome. The approach to most problems presented in this book is both cytological and clinical. The origins of mosaicism and the various hypothetical mechanisms which may result in abnormal karyotypes are discussed at some length, and it is probably from these parts of the book that some controversy may arise. There are numerous graphs, illustrations and tables. The bibliography covers publications well into 1964 and is invaluable as a source of information. The rapidity of discovery and development in this field is, however, such that already, a few months after the publication of the book, new important information is available which could not be included.

*Human Genetics* deals with three active fields of research, namely population studies, the genetics of somatic cells and cells in culture, and human proteins. In it, chromosome anomalies play only a minor part in the second section, which deals with cell culture. There the main emphasis is on the sex-linked genes, and the state of the X chromosome is discussed in conjunction with the Lyon hypothesis. Otherwise, this part is mostly concerned with cell selection, cell antigens and the localization of biochemical mutants. Interesting structural effects of irradiating chromosomes in cultures and of radiomimetic substances are reported, but the analysis of gene mutations by such means is still in its infancy. Other techniques may prove more successful in this field. The impression gained from reading this section of the symposium is one of rapid growth in separate specialized groups without, as yet, much regard to the possibilities of integration or generalization. On the other hand, the last section of the monograph, which deals with the genetics of human proteins, covers the considerably more homogeneous and well-established subject of the polymorphisms of haemoglobins, haptoglobins, gammaglobulins and certain enzymes as well as immunogenetics. There the mutual understanding of the several participants is also obvious from the quality of their discussions.

The first part of the book contains studies of many different kinds of human population; this subject seems to be in a state of flux so that a few contributions appear a little repetitive and perhaps tired, while others hint at novel approaches. General problems such as the effects of drift, of the genetical load, of lethal equivalents, polymorphism, and the effects of pleiotropism are once more discussed. Perhaps more rewarding are specific genetical studies on populations in Brazil, India, the American Indians as well as the 'Amish'. Most promising is the study of the nature and consequences of ethnic mixtures among the immigrant communities of Israel; the information summarized in this paper will provide an important and unique base line for future research. A lively contribution by Gajdusek describes some very unexpected consequences of the highly lethal Kuru disease in New Guinea which has led to a considerable numerical increase in the affected Fore population. His vivid account of other vagaries of 'selection' and the general unpredictability of events which control the genetical fate of small primitive people provides a most impressive and healthy contrast to the traditional unquestioning assumptions of gene equilibria, or at best the slow action of persistent selective forces in all circumstances. These have operated in the large populations of modern man, and some of their effects are described by the other contributors.

In the framework of a short review it is unfortunately impossible to do justice to all the contributions in the symposium, nor is it possible to offer detailed criticism. While most papers individually come up to the high standards of the Cold Spring Harbor Symposia, it appears to me that as a synthesis this particular volume does not reach the excellence of its best predecessors. This is borne out by the last concluding chapter, where Bentley Glass more or less despairs of summarizing the heterogeneous subject-matter.

H. KALMUS