REVIEWS

CELL CULTURE AND SOMATIC VARIATION. Morgan Harris. Holt, Rinehart and Winston, Inc. New York. 1964. Pp. 548+x. \$15.00

If completed with a chapter on cell structure and function, especially on ultra-structures and on functions in macro-molecular terms, this book could rightly have the title "Cell Biology". It is in fact, apart from the omission just mentioned, a very thorough and comprehensive monograph on the study of cells as organisms. There is a chapter on "Micro-organisms as model systems" which, though not really part of the subject, provides a useful summary of the methods and approaches of microbial genetics with a view to possible applications in cell biology. Written by a distinguished cell biologist and based on an obviously gigantic knowledge of the literature this book constitutes an indispensable reference for anybody working on cell or organ culture, differentiation, carcinogenesis *in vitro* and *vivo*, histocompatibility and their various nutritional, genetical, karyological and immunological aspects and interrelations.

The book covers such a wide field that no detailed review is possible. An amusing exercise in reading it is to ask the question: Which sections of cell biology have reached the stage of theoretical and methodological precision which is required for rapid advance?

Clearly, there will be as many answers as there are readers. My own, for what it is worth, is that only three fields are approaching this stage: nutrition of cells in culture, virus-induced carcinogenesis in cell cultures and histocompatibility.

Among the areas still in the uttermost confusion with heaps of facts and no rhyme or reason I should like to single out three: that on senescence of cell cultures, that of carcinogenesis and, foremost, that of differentiation.

In these areas the huge mass of "facts", many uncritically documented, provokes a wide range of reactions. At the one end there are those who think that we need more and better established facts to start formulating the possible relations between them and proceed from there. Naturally, among those whose activities are primarily in embryology, cell biology or oncology a high proportion hold this view. Even more naturally they expect that breakthroughs will be led by those who practise in these fields.

At the other end there are biophysicists, biochemists and molecular biologists who feel that an intelligent look at the field by people, like themselves, not confused by "facts" will lead to the right, clear and simple questions and to the design of critical experiments. They are supported in these convictions by the spectacular successes of molecular biology in giving some precise answers to one part of the problems of heredity.

Both these views are, of course, extreme. The first, because repeatedly in biology—see Pasteur, Fisher, Delbruck, Haldane—new vistas have been opened by outsiders with a fresh mind. The second, because, as I have stressed before, the successes of molecular biology, great as they are, consist in having given chemical content to ideas which, with one exception, classical genetics had formulated before and quite clearly. The exception is co-linearity at the molecular level of gene structure and protein structure.

To get out of the quagmire of problems in cell biology, which Harris' book so successfully brings to light, the need is for cell biologists to learn molecular biology and for molecular biologists to learn cell biology. Those who claim that they are itching to tackle differentiation could very well start by doing some homework with this very useful book.

G. PONTECORVO.

HUMAN DIVERSITY. THE NATURE AND SIGNIFICANCE OF DIFFERENCES AMONG MEN. Kenneth Mather. Oliver & Boyd, Edinburgh and London, 1964. Pp. 126+vi. 21s.

This book has a unique quality about it, reflecting as it does the particular approach to genetics that the author has done so much to develop. Nevertheless, the text is simple to understand and manifests none of the mathematical complexities that are so often associated with population and quantitative genetics. The statement that none of the mathematics "goes beyond 'O' level" is true.

The author does not set out to give an account of formal human genetics, polygenic inheritance, population genetics, genetic equilibria, the interaction between genotype and environment, or even the non-organic transmission of information, but includes some ideas from all of these topics as and when necessary. Particular emphasis is laid on the ubiquity of variation, its measurement, its causation, as well as the inherent tendency for delicately balanced equilibria to develop and the factors that tend to disturb them. The discussion of intelligence, its inheritance and of the probable effect of natural selection on it is particularly well presented, as are the sections on the transmission of ideas, on social evolution and on the interaction between variance and social structure.

The text is remarkably lucid. It is a pity that the author chose to use *N* and *A* as symbols for the "normal" gene and its mutant allelomorph, rather than the more conventional upper case and lower case letter, particularly as he has used the latter in fig. 5 when demonstrating segregation and recombination. Although this minor point is not likely to worry non-professional biologists, I believe that they will find fig. 6, illustrating an equilibrium between mutation and counter-selection, and fig. 8, showing the balance of selective forces in sickle-cell anaemia, particularly difficult to understand.

This book is not written for the professional biologist although I believe he will find it enjoyable as well as useful, particularly when preparing lectures for a lay audience. The book should be particularly valuable to medical men, sociologists, educationalists and others forcibly reminded of human diversity in their everyday occupations. I earnestly hope that politicians can be persuaded to read it, but am not over optimistic.

P. M. SHEPPARD.

GENETICS AND MAN. C. D. Darlington. Published by George Allen and Unwin Ltd., London, 1964. Pp. 382. 42s.

This book is a revised edition, with several new sections and a new title, of the 1958 *Facts of Life*. Though the title is more conventional, the book still has the liveliness and the intriguing, rather perverse slant of the first