

cells, which are referred to as 'mobile cells which circulate in the blood stream' (p. 216)—scarcely a normal state of affairs. On the same page the possibility of inducing antibody formation *ab initio* in cultures of lymphoid tissue is denied, in spite of published evidence to the contrary. Finally, on p. 219, the impression is given that antigens are foreign proteins which are necessarily 'dangerous' to the host, a proposition which is certainly arguable.

A work such as this can only crystallize the facts and theories relating to growth as they present themselves to the author at the time of writing. Speculations will continue to appear, particularly apropos the most intriguing question of the overall regulation of growth; in this context it is regretted that Dr. Needham was not able to describe and evaluate the suggestions which have been put forward recently by Burwell and Burch in their publications on 'morphostasis'. However, even if no further editions of this book were to appear for some years to come, the present volume would provide a starting point for anyone requiring a bird's-eye view of growth in all its aspects.

The illustrations, both photographs and line drawings, are large and clear. The style is readable, though not improved by the frequent use of abbreviations; it is difficult to see why they should be necessary in a publication of this kind.

This is not a book to be recommended to students early in their biological training, but it will be extremely useful to final-year honours students, and to teachers and research workers in zoology or the medical sciences. It is the kind of book which one hopes will appear more frequently, embracing as it does all aspects of a topic from the morphological to the biochemical via physiology and cytology. Unfortunately, as the barriers between the various biological disciplines inevitably (and rightly) become blurred, so will it become increasingly difficult to find individuals capable of succeeding, as Dr. Needham has done, in presenting the whole picture.

J. A. SHARP

HUMAN DIVERSITY

Human Diversity

The Nature and Significance of Differences Among Men. By Prof. Kenneth Mather. Pp. vi+126. (Edinburgh and London: Oliver and Boyd, Ltd., 1964.) 21s.

IN 1960 Prof. Kenneth Mather delivered the Ballard-Matthews Lectures in the University College of North Wales. In *Human Diversity*, which is based on those lectures, he has set himself the task of presenting a study of the causes of human diversity 'to all who are seeking a better understanding of human differences and their importance for our populations and societies'.

He has done so under eight headings: the study of diversity; causes of diversity: the environment; genes and diversity; mutation and selection: radiation and medicine; polymorphisms: blood characters; continuous variation: intelligence; social transmission and social evolution; the interplay of genetical differences and social development. There are sixteen figures, a bibliography with thirty-five references and a short index.

In developing his ideas on a complex subject, an author is entitled to follow paths familiar to him for as long as they serve their purpose. It is not surprising, therefore, to find that the approach in this book is predominantly a genetical one, with illustrations drawn on one hand from conditions caused by a few gene differences of major effect and continuous variation on the other.

The resultant discussions are valuable for their own sake, quite apart from the purpose of the book as a whole. The examples chosen include achondroplasiac dwarfism, haemophilia, and phenyl-ketouria with its associated

mental deficiency, differing from the normal only in single genes as compared with polygenic systems composed of numbers of genes sometimes balancing one another out and sometimes supplementing one another to produce large differences, often with the effects further modified by the environment.

The causes of human diversity are accepted as environmental, genetical and social, and the comments on upsetting and re-striking the balance could, with profit, have been extended, including the influence of preventive medicine in raising the general standards of health. Even so, the warnings are clearly expressed in that "we can raise the number of afflicted people in later generations but not lower it" and, equally significantly, "the genetically less well endowed may be enabled to survive and multiply more rapidly and effectively by the activities of the genetically better endowed, who under a simpler system would be their competitors".

The final conclusion is that society is the end-product of biological development and that the study of society must play its part in the greater biology. The importance of education, in its broadest sense as covering the transmission of information, ideas, forms of behaviour and beliefs of all kinds, is emphasized.

The book is well-written and the question 'for whom is it intended?' scarcely arises. Prof. Mather has presented the picture as he sees it with the aim of stimulating an appreciation on the part of the general reader, as well as the professional biologist, of the need for further efforts to understand ourselves and our destiny.

A. LESLIE BANKS

SOURCES OF RADIATION

Radiation Sources

Edited by Prof. A. Charlesby. Pp. vii+268. (London and New York: Pergamon Press, 1964.) 80s. net.

IN his book, *Radiation Sources*, Prof. Charlesby has collected a great deal of useful material for anyone wishing to make use of radiation sources in physics, chemistry or biology. Potential users would be in a good position to choose appropriate apparatus after reading the book thoroughly. However, an introductory chapter reviewing the salient points of the various sources of radiation would have been useful. The type of treatment given by the contributors varies widely throughout the book, and in particular the style ranges from the traditionally scientific to that associated with commercial marketing.

The chapter on nuclear reactors surveys the field adequately and considers the usefulness of various types of reactor for γ -radiation, and slow and fast neutron work. In another chapter isotopic sources of radiation power are fully covered, from small experimental sources up to large industrial irradiators. The position on available sources in respect of price and specific activity has already changed in some instances since the writers obtained their information.

The chapter on Van de Graaff accelerators displays an intimate knowledge of the historical development of these devices and deals with the subject in detail.

Cylindrical electrostatic generators are introduced in a somewhat philosophical manner, and the chapter gives no references to the literature. Resonant-transformer electron-beam generators are described in a concise and straightforward way. Linear accelerator sources are also described in a lucid style and the variations in design are brought out clearly. The costing figures, however, assume that a single installation is adequate for commercial purposes.

The treatment of radiation protection aspects of design and operation of radiation facilities brings out, among