

that in this struggle for existence, the fittest would survive", so leaving open the question of "Fittest for what?" (p. 481). The survival of the fittest was Spencer's phrase, not Darwin's, and no one reading Darwin could believe that he related natural selection to the mere survival of individuals, or could have any doubts as to what constituted fitness. Nor is the presentation of the technical genetics always clear: it is not, for example, easy to understand the formal inheritance of eye-colour differences from Chapter II, nor can any real understanding of meiosis be gleaned from the figure on p. 14. The style too is irritating at times. "We know at last what a human sperm carries—the precious load that it fights so desperately to deliver . . ." (p. 6), and ". . . the plump Abbot Gregor Mendel, waddling about in the garden . . . resolved to confine his studies to his own little patch and not to wander afield (possibly because he was too fat to travel comfortably) . . ." (p. 52). To say the least, this is an ungracious description of a great scientist, unnecessary even if historically true, which, so far as I am aware, it is not. "Biologists" we are told in the brief historical survey of genetics "were floundering about in confusion" before Morgan (p. 55), while no reference is here made to such men as Johannsen, who was responsible for the clear statement of the relation of phenotype to genotype and environment which provides the theme of the book, and Bateson, who did more than anyone else to establish that "the mechanism of heredity is almost the same in all living things", a principle that Mr Scheinfeld (p. 3) properly describes as one of the amazing, and we might add basic, discoveries of genetics. Surely, if such is his wish, he could do honour to his fellow countryman without failing to give credit to such other great figures of the past.

These comments, however, should be taken more as warnings for the student than discouragements for the general reader. The book should be judged by the standards of its aims. It is not a textbook, even though some may seek to use it as such; but it is very much more than the tittle-tattle which so often passes for popular science. It is a valuable attempt to set before the layman an honest picture of himself as the product of his hereditary endowment and his environmental circumstances. The picture is necessarily neither complete nor always clear—if such were possible human genetics would be at an end—but it provides much information, dispels many myths and sets some of the great social problems of our time in a new and truer light. It could be read with profit by all who seek a better understanding of themselves and the society they live in. Wide appreciation of the knowledge, considerations, problems and issues set out in *You and Heredity* is essential if our society is to prosper. It is not enough that we geneticists should discover these things, formulate these problems and come to these conclusions: they and their implications are basic to our well being and must not remain hidden in learned journals and specialist texts. In setting them out for a wider audience Mr Scheinfeld does a service to us all.

K. MATHER.

AN INTRODUCTION TO THE EMBRYOLOGY OF ANGIOSPERMS. By P. Maheshwari. New York, Toronto, London: McGraw-Hill Book Company, Inc. 1950. Pp. 453+x 55s. 6d.

Embryology is concerned with the development of the spores, the germ cells, the embryo and the endosperm in the higher plants. Its description

has been given a tentative coherence by the theory of evolution with its subordinate inferences of homology and phylogeny. Professor Maheshwari's book, after an excellent historical introduction, follows this classical pattern with care and success. The homology and the phylogeny may be dubious at the cellular level but they are relegated with experimental questions to the end of the book and therefore cast no shadow over the descriptive body of the book.

There is however a fundamental means of unifying embryology and of thus giving it scientific uses and applications. Students of genetics and physiology will see these uses on all sides. They will notice that the developments described lead to and from meiosis and fertilisation. These two processes are the central facts of the plant's life determining profound changes in the properties—physiological and genetic properties—of the cells taking part.

These effects are not noticed by Maheshwari. Nor indeed does he notice how the different types of plant development are bound up with new experimental fields of enquiry. Different forms of pollen development illustrate principles of cell-differentiation, cell physiology and properties of hereditary variation and natural selection. The same is true of the endosperm and the embryo with their variations in sexual and subsexual reproduction. The experiments of Renner on embryo-sac competition in *Oenothera* are no less fundamental to embryology than they are to genetics, physiology and biochemistry. The unicellular stage of development in the higher plants is indeed a focus of scientific enquiry. And the last person to realise this is, apparently, the embryologist!

In all these directions a genetic vacuum is apparent in Maheshwari's book. It is a vacuum which has persisted because embryology is a laborious study in the enquiry and perhaps even more in the reading of it. Embryology is however capable of taking us forward as much as the genetics of micro-organisms—another long-neglected study—is already doing. To provide the basis of this advance it will however be necessary for the author of a work on embryology to extend his interests to papers which introduce other ideas than those of the last century.

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THE GENETICS OF THE DOG. By Marca Burns, B.Sc. Edinburgh: Commonwealth Bureau of Animal Breeding and Genetics. 1952. Pp. vi+121. 12s. 6d.

Dog breeding is full of pitfalls and dog breeders are full of folklore. Miss Marca Burns endeavours to introduce some genetics to them. She covers a wide field but her understanding of it is not entirely clear. Half-way through her book, she discovers, almost to her own surprise, that "The orthodox theory that inheritance is entirely determined, at the time of fertilisation, by the genes which the fertilised egg happens to contain, is in some respects illogical." In these circumstances she feels compelled to admit that "Lysenko's explanation of a direct effect of the environment on the heredity (after a few generations) is attractive." Lysenko is right. Or, at least, that he would have been right if he had ventured to talk about animals.

It is not remarkable that Miss Burns should hold these views. The same views were held in the same place, Edinburgh, by Professor James Cossar Ewart before Miss Burns or, for that matter, Lysenko was born.