

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.

C. D. DARLINGTON.

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.

In any case these views are still held by illiterate people all over the world. What is remarkable is that they should now be expounded in this country coupled with the name of Lysenko. And that they should be expounded under the auspices of an agency supported by national funds and intended for the publication of useful information : the Commonwealth Agricultural Bureaux.

C. D. DARLINGTON.

SYMPOSIUM ON RADIATION MICROBIOLOGY AND BIOCHEMISTRY. Sponsored by The Biology Division, Oak Ridge National Laboratory. Reprinted from *J. Cell Comp. Physiol.* Vol. 39, Suppl. 1. 1952. Pp. 128.

There are seven papers and three abstracts in this Symposium.

W. M. Dale is concerned with the evidence that X-radiation acts in causing mutations through intermediate products especially OH radicals and H atoms. Using the principle that one solution should accordingly "protect" another from X-ray damage, Dale has carried out experiments which suggest either a chain reaction or an activated state in the protector molecule.

L. H. Gray discusses the physical and biological evidence of the nature of the energy transfer from ionising particles. He points out the possible difference in regard to dispersal of damage between chromosome fragmentation and inactivation of viruses or spores. Zirkle and others attempt to show with survival curves that the latter effect is very rapid.

Hollaender and others show the effects of water content and oxygen pressure on mutation in *Aspergillus* spores. Swanson suggests that ultra-violet mutation rate is increased by nitrogen mustard pre-treatment. Newcombe proposes that bacteria should be regarded as haploid and therefore genetically irreducible. This is more of an assumption than it may seem.

C. D. DARLINGTON.

BOOKS RECEIVED

PROCEEDINGS OF THE SOCIETY FOR THE STUDY OF FERTILITY. No. III Cambridge Conference. Cambridge : Heffer. 1951. Pp. 79. 10s.

A useful discussion by 13 British and American workers of the causes of sterility chiefly human from all aspects except the genetic. A Danish visitor however gives the evidence that absence of the vas deferens is hereditary in cattle.

PFLANZENÜCHTUNG. 1. GRUNDZUGE DER PFLANZENÜCHTUNG. By Hermann Kuckuck. Berlin : Walter de Gruyter & Co. 1952. Pp. 132, illus. $10\frac{1}{2} \times 15\frac{1}{2}$ cm. Paper covers.

GENERAL GENETICS. By Adrian M. Srb and Ray D. Owen. California : W. H. Freeman & Co. 1952. \$5.50 (47s.).