the layman to a new point of view. At present the traditional methods of our penal system are taken for granted, and little, if any, thought is given to such a vital problem. C. STANFORD READ.

Problems of Population. Edited by G. H. L. F. PITT-RIVERS, B.Sc. London: George Allen & Unwin, Ltd., 1932. Pp. 378. Price 15*s.* net.

This volume contains the text of the papers read at the meeting of the International Union for the Scientific Investigation of Population Problems held at London in June, 1931. The modern interest in these problems dates from the time of Malthus, but the manner in which the questions are appreciated has altered. The original problem was conceived almost exclusively in terms of density in relation to food supply. Many other conditions have to be considered to-day. An economically unabsorbed population can co-exist with a food surplus.

The papers range over a very wide field, and all are of interest to the non-technical reader, with the exception of a few, the comprehension of which involves the knowledge of somewhat advanced mathematics. Such subjects as the conditions which influence population density, the effects of migration restrictions, the relation between population and food supply and the comparative fertility in different social classes are discussed.

Some of the papers have a very definite medical interest. Malthus envisaged population as a menacing force brooding over humanity and threatening it with a burden of misery. To-day we regard population as another of the forces of nature which can be controlled in the interests of humanity. The change has been brought about by the adoption of contraceptive measures and (in some countries) by the practice of induced abortion. These subjects are complicated by social, economic and religious considerations. But whatever our personal views may be, the questions involved must be faced. The growth of mass-production has contributed to the evolution of a higher standard of living, indicated by a general demand for things which, not so long ago, would have been regarded as luxuries. Another factor in the situation, discussed by Dr. George W. Kosmak, is the increasing dread of the discomforts and dangers of pregnancy and labour, and this is, of course, intimately connected with the puerperal death-rate, and with the tendency to postpone marriage. Further, it is a question whether our increasingly complicated civilization does not tend to a reduction of natural fertility, quite apart from the use of contraceptives. On all these topics our profession should be prepared to take its share in the guidance of public and individual opinion. But we cannot act as guides unless we have studied the paths for ourselves.

M. HAMBLIN SMITH.

The Causes of Evolution. By J. B. S. HALDANE. London: Longmans, Green & Co., Ltd., 1932. Pp. 235. Price 7*s.* 6*d.*

The book, which is based on a series of lectures, presents concisely one of the modern views of the subject. It constitutes a useful survey, since much of the evidence adduced in support of its tenets depends on researches carried out by various workers in very recent years, and it draws attention, moreover, to several papers of earlier date that have been generally overlooked.

The author's main argument is that the power of natural selection (in conjunction with the organism's capacity for variation) is sufficient to have brought about evolution. One of the principal exponents of mathematical theories, as applied to biological problems, he indicates how the effectiveness of selection in determining the fate of variations in different circumstances may be actually measured. He also gives plausible explanations for the evolution of useless and incapacitating characters. His standpoint differs from that of Darwin, first, in its emphasis on the importance, in evolution, of the sudden origin of new species by mutation or hybridization; secondly, in its recognition of the tendency of variation in a given species to occur in certain definite directions rather than completely at random; thirdly, in its denial of any evolutionary importance in acquired characters; and lastly, in its explanation of heredity in terms of Mendelian interaction of genes. A diversity of clear-cut examples are given, in which intra-specific variations, and even inter-specific differences, are shown to be the outcome of physical and demonstrable differences in chromosomal constitution.

A question dismissed somewhat unsatisfactorily is that of the heritability of characters acquired in response to such environmental factors as have acted on a species for many consecutive generations. The author's contentions that "little real novelty has been shown in the course of evolution", and that the reshuffling and rare mutation of genes will adequately account for all heritable variations, are likely to leave some readers unconvinced.

In his conclusion the writer treats in a brief but entertaining manner some of the philosophical aspects of the subject. The evolution of mind and the influence of mind on further evolution are both referred to here, but a discourse on eugenics is not undertaken.

About one-fifth of the book is occupied by an appendix, in which mathematical treatment is given of such problems as the causes influencing intensity of selection in various types of populations. While a good deal of space is certainly spent in demonstrating the obvious, some unexpected propositions are proved. It is established, for example, "that a normally distributed population cannot be in stable equilibrium as a result of selection for the character normally distributed". Though valuable to the specialist and very clearly presented, this appendix will, as the author remarks, "have a limited appeal"; but the body of the book should prove pleasant reading as well as useful and suggestive to many who are interested in biological subjects.

CATHERINE L. T. LUCAS.

Experimental Analysis of Development. By BERNHARD DÜRKEN. Translated by H. G. and A. M. NEWTH. London: George Allen & Unwin, Ltd., 1932. Pp. 288. Price 14*s*.

This is a textbook of convenient dimensions, which covers the whole field of experimental embryology. It is intended to render easily available to biology students and medical men the advances lately achieved in our knowledge of some fundamental problems. It will be valued as such, for it is clearly and methodically written and beautifully illustrated. By a careful analysis of the often very remarkable experiments described, the theory of epigenetic as opposed to preformational development is built up. The fertilized egg, or the embryo at any age, is envisaged as a system in which neither the definitive parts nor even all the genes are represented individually by matter. It is