by Carr Saunders. But how overpoweringly important it has become for man ! It is only now that we realise that ever since the origin of agriculture man has been destroying his habitat. He has been doing so by the unlimited application of one new invention after another, application always for his immediate profit.

Thus civilised man is no longer obeying the rules which applied to his ancestors and indeed still apply to all animal species and to all primitive men. Civilised man was aware that he had created a new order but was unaware that he was destroying an old order. One of the rules that civilised man is no longer obeying throws a new light on the history of evolutionary theory. For we remember that Darwin and Wallace both took the idea of the struggle for existence in nature from Malthus' observation that starvation limits survival in man. We now see, however, that when the Darwinian poet spoke of "nature red in tooth and claw" it was true only of civilised and domesticated man, especially nineteenth and twentieth century man. It was much less true (as Kropotkin showed) of the general process of evolution in animals or of man in a state of nature. It was only with civilisation that men began to pursue a policy of unlimited and competitive expansion.

Nor is this an idle historical retrospect for it forces us to notice what happened when man became domesticated or civilised. The rapid changes that have followed in the conditions of his subsistence, in the regulation of his populations, and his relation with disease, have consequences which have left his technical advances and his intellectual understanding some way behind. Indeed some way behind what he needs to assure a return to equilibrium and a prospect of survival.

Professor Wynne-Edwards' book has more in it for more readers than the method of presentation allows him to make clear. Perhaps he will develop his views in a lighter volume. Let us hope he will then reverse his present order and give us his premises and his problem in the first chapter developing his conclusions at the end.

C. D. DARLINGTON.

AN INTRODUCTION TO THE CYTOGENETICS OF POLYPLOIDS. G. W. P. Dawson. Pp. 96. 28 text figs., 1 plate. Oxford: Blackwell Scientific Publications. 1962. 10s. 6d.

To begin at the beginning of the book I think Mr Dawson has chosen an unfortunate title. Contrary to the opening sentence of Chapter 1 the word polyploidy by most people is restricted to mean, precisely, numerical change in complete chromosome sets and not, as in the book, any change in chromosome number. An account is, however, given of the genetical and cytological consequences of all categories of numerical change ; *auto-* and *allopolyploidy*, *aneuploidy* and the addition of supernumerary or *B* chromosomes.

Throughout the book there is a welcome blend of formal genetics with the description of chromosome behaviour, including tetrasomic inheritance, the consequences of mutation and selection and, at the end, a brief reference to ecological and taxonomic matters associated with changes in chromosome numbers. The scope of the book is in fact adequate and suitable for the readers envisaged, namely undergraduates in Biology and Agriculture. Less suitable, however, is the presentation of some of the material. The account of chromosome pairing and fertility in polyploids is especially unhelpful. For example it is unusual and misleading to refer to zygotene or pachytene associations of two, three and four homologous chromosomes

as bivalents, trivalents and quadrivalents respectively. The words are properly descriptive of diplotene or first metaphase associations held together, usually, by chiasmata. That the point is not trivial is reflected on page 24 where "quadrivalents" at prophase are resolved, through chiasma formation, to bivalents at first metaphase. Another disappointing section is that dealing with tetrasomic inheritance, particularly with double reduction. Since α values for double reduction are given and discussed it would surely have been much clearer to state simply at the outset that α for any locus depends on equational separation and non-disjunction at the first anaphase of meiosis and non-disjunction at the second. As it is one is left in some doubt which is reinforced by the unfortunate misprint in fig. 19 (m for M).

H. REES.

GENETICS OF MICRO-ORGANISMS. British Medical Bulletin. Vol. 18, No. 1. Pp. 84. 20s.

The scope of the British Medical Bulletin, whose original object was to provide a guide to medical science and thought, has in the course of time been broadened to include subjects of more general biological interest which are relevant to medicine. Even in this wider context it cannot be claimed that the genetics of micro-organisms has any great bearing on clinical medicine, and the justification, if any is needed, for devoting a Bulletin to this topic is that microbial studies have given a deeper insight into the nature of gene action and indirectly led to a renewed interest in genetic aspects of human metabolism. It is therefore not surprising to find that this Bulletin is not, as its title might imply, a survey of microbial genetics as a whole, but of those aspects which have so far contributed results of most interest to biochemical genetics. Within these limits it can be highly recommended to anyone wishing to become acquainted with the genetics of bacteria and bacteriophages: the articles are brief, amply documented, and as up-to-date as reviews of a rapidly advancing subject can be.

In a series of papers dealing with the genetic basis of the control of metabolism, Burton opens with a concise account of the chemistry of DNA and summarizes progress on one of its outstanding problems, namely the analysis of nucleotide sequences. There are many obstacles in the way of the direct approach to the reading of the genetic message but considerable advance towards deciphering the code has been made by the use of synthetic polyribonucleotides in model systems. This important work is possibly too recent for it to have been mentioned in Brown's paper, "Ribonucleic acid and bacterial genetics", which is, nevertheless, a useful summary of current views on the role of ribonucleic acids in the synthesis of proteins by *Escherichia coli*. Two articles, one by Fincham, the other by Fisher, deal with the qualitative and quantitative control of protein synthesis by genetic elements. Fincham's paper, in particular draws attention to the complexities of the structural control of enzyme formation, and in doing so emphasises the lack of precise biochemical knowledge of the mode of action of enzymes.

A second group of papers surveys the genetic phenomena found in bacteria and bacteriophages. Transformation is represented by two articles: Jackson's briefly covers the historical and experimental background to capsular transformation in the *Pneumococcus* and then deals in more detail