REVIEWS

THE EVOLUTION OF DEVELOPMENT. By John Tryler Bonner. Cambridge: The University Press. 1958. Pp. 103+vii. 17s. 6d.

This pleasant little book, based on three lectures given at University College, London, looks at development in plants and animals in terms of evolution. Although this approach may not be as novel as the jacket advertisement would have one believe, it is a useful way of dealing with an important and difficult aspect of biology. In a hundred not very large pages of text, the author obviously cannot explore very far. He limits himself to a few organisms, one of them being the slime mould *Dictostelium* on which he has himself done much interesting and significant work.

Geneticists may have some difficulty in following Bonner's brief discussion of gene action. Consider, for example, the following sentences: "I do not mean to imply, however, that metabolism is run by genes, because except for synthesis it is not. The genes confine their activities to the manufacture of essential parts to keep the motor going; hence they are concerned with intracellular reproduction." It is not clear whether Bonner is referring solely to the primary role of genes in determining the structures of such macromolecules as ribonucleic acid and proteins, or whether he means also to include control of one or more steps beyond. From a later statement that "... one relatively simple aspect of gene action ... that remains helpful and useful ... is the idea that genes exert their effect primarily through the control of rates of processes," it would appear that he means the latter. If so, it is obvious that in this sense gene action is by no means limited to the control of synthesis.

G. W. BEADLE.

BIOLOGICAL ASPECTS OF CANCER. By Julian Huxley. London: George Allen & Unwin. 1958. Pp. 156. 16s.

This is not a long book but it is an important one. Originating as a lecture delivered in New York, and developed as a review article which turned out to be considerably longer than expected, it presents the facts and problems of cancer as a biologist sees them. A wide variety of experimental evidence is surveyed, from plants as well as animals, the author using the term cancer to denote all malignant tumours. It is looked at from many points of view, cancer being, as is pointed out in the preface, a key subject for biology in its present state. There is a valuable list of some 500 references.

Seen genetically, perhaps the most important emphasis of the book is on cancer as the consequence of an escape of cells from the control and discipline of the genotype. Genetic unbalance, whether arising from wide crossing or inbreeding, expresses itself through upset of developmental processes which, if it involves abnormal persistence of cell proliferation, can lead to cancer. And once the cells have escaped from the normal genetic control, they take on an autonomy which endows them with a genetics of their own, so that they vary, are selected and evolve in their own right, within, of course, the limits of persistence imposed on them by the survival of their host or their transfer to new host individuals.

The genetical interest of cancer, and the importance of genetical principles for the study of cancer, thus emerge as beyond question. At the same time the genetical approach is but one of the many which are brought together in a treatment distinguished for the breadth of its view. Few experimental biologists can fail to derive stimulation from Huxley's presentation; and indeed perhaps the best comment by way of summing up is to say that at least one reader is left with no doubt of the profit which, paraphrasing the words of the preface, biological science will derive from incorporating the cancer problem in its purview. KENNETH MATHER.

THE SPECIES PROBLEM. Edited by E. Mayr. Pub. No. 50 American Ass. Adv. of Science, Washington: Bailey Bros. and Swinfen Ltd., London. 1957. Pp. 395. 80s.

The classification of living organisms into species was developed originally for the convenience of identification. For this purpose the procedure for classifying was, and still is, a problem in itself. With the advent of Darwinism and, more recently, of genetics, it was natural to attempt to reconcile these units of identification with the units of variation and of evolution. Thus arose a new problem of a more profound and formidable character. A symposium to consider the problem was held at the meeting of the American Association for the Advancement of Science in Atlanta in 1955, the proceedings of which are recorded in this book.

The problem is defined and presented in an introduction by Professor Mayr. Contributions follow by Americans eminent in a wide variety of fields, genetics (H. L. Carson and T. M. Sonneborn), physiology (C. Ladd Prosser), embryology (J. A. Moore), palæontology (J. Imbrie) and systematics (V. Grant and J. L. Brooks). Professor Mayr sums up in the final paper.

There is, in general, agreement that the concept of the species in the modern, "biological", sense is meaningful and worthwhile. On theoretical grounds the species concept has been enriched, and has benefited from, the infusion of genetic principles relating to gene flow and to genetic diversity as a basis for adaptive specialisation. In practice, as is made clear, there are difficulties of application, in particular to organisms reproducing asexually. The opinion of the majority of the contributors, and of Professor Mayr, that the benefits outweigh the difficulties, will not surprise and indeed will be endorsed by most biologists. Agreeable a feature though this may be it is perhaps not sufficient to encourage spending £4. There are, however, two other good reasons for recommending this book. Firstly, the papers are admirable, up-to-date summaries of results from an unusually wide range of investigations, each with an approach of its own, and each making its own special contribution to the same central problem. The result is thus to enlarge and extend one's appreciation of the concept of species and speciation. Secondly, Professor Sonneborn's article, dealing chiefly with *Paramecium*, is outstanding for its comprehensive analysis of natural populations considered from the standpoint both of individuals and of genetic systems. H. REES.

INSIDE THE LIVING CELL. By J. A. V. Butler. London: Allen & Unwin. 1959. Pp. 174, with 16 plates. 21s.

Professor Butler is a distinguished chemist who has worked on biological problems and in this book he discusses many of the topics which are important centres of biological research to-day. His subject matter ranges