REVIEWS

THE GENETICS OF BEHAVIOUR. L. Ehrman and P. Parsons. Sinauer Associates, Inc., Sunderland, Mass., 1976. Pp. viii + 390, 22 cm.

There are two broad areas of interest in behaviour genetics. The first involves tracing the pathways linking the genome with behaviour and consequently is concerned with questions about how genes specify the properties of nervous systems. The second is concerned with questions about the genetic organisation of behaviour itself, in the individual and in the population, and how genetically controlled differences in behaviour relate to fitness and to evolutionary change. It is largely this second area which gives perspective for this book.

Chapters 2 to 5 provide an introduction to genetics as applied to behaviour, beginning with what the authors call "requisite genetics", showing that genetic principles can be studied using behaviour. They proceed from behaviours under the control of single genes and chromosomes, to those controlled by many genes. Chapters 6 and 7 provide the theoretical bases for analysis of traits controlled by many genes in experimental animals and man, including methods for partitioning of phenotypic variance and estimation of heritability. Chapters 8 to 12, which together with the succeeding sections form the major part of the book, look at behaviour phylogenetically in a wide spectrum of organisms including some prokaryotes although, as is only to be expected, *Drosophila* and rodents are given particular attention and chapters 11 and 12 are devoted exclusively to man. Chapter 13 deals with the role of behaviour in evolution, integrating material from preceding sections. Chapter 14 discusses the place of behaviour genetics in evolutionary biology with comments on likely future trends.

Much of what has been achieved in behaviour genetics takes us to the point of showing that there is some degree of genetic control but the material is frequently unsuitable for further genetic analysis in depth. This focuses our attention on the necessity for deciding what particular genetic problem about behaviour we want to investigate and what sort of material is necessary to solve it. It is here that the great advantages to using various species of *Drosophila* stand out. This is the only higher organism in which complete in-depth analysis of the genetic structure of a polygenically controlled behavioural phenotype is immediately possible in terms of the number and location of relevant gene loci and of the genetic architecture of the character in experimental and natural populations. It is for this reason that *Drosophila* populations provide the main testing ground on which the differences between contending predictions about the consequences of different modes of selection can be fought out. "But fruitflies don't learn anything" is the often repeated and understandable reason why studies with *Drosophila* have little appeal for the mainstream of interest in experimental psychology. Consequently the recent demonstration, in at least three independent laboratories, that *Drosophila* is capable of a modest form of associative learning behaviour might almost be cited as an empirical demonstration of the efficacy of prayer! What it holds out to us is the possibility of locating, characterising and manipulating, individual genes concerned with a learning system.

The authors' treatment of the genetics of human behaviour is nicely

balanced. The present state of the IQ debate is skilfully outlined, although it is accorded no more space than its due among other socially relevant aspects of human behavioural differences. In the last section of the book the authors turn to the role of behaviour in evolution, giving an interesting account of habitat selection and agonistic behaviour in relation to population structure in rodents. The picture which emerges, of genes in demes, is one for which we find a suggestive analogy in tribal man resulting from genetic and linguistic divergence. Current notions in sociobiology go vastly beyond our knowledge of the actual genetic structure of populations and the extent to which culturally (paragenetically) transmitted behavioural traits have contributed to the shaping of that structure. Conversely, we are very insecure about how far the genetic structure of populations in turn defines the degree to which they are capable of modifying their behaviour to meet the challenge of new environments.

The book which is designed with taste, clear and easy to read, is suitable for use at undergraduate and early postgraduate levels. Its publication is timely and will be welcomed not only by those responsible for teaching behaviour genetics, but also those with interests in evolutionary biology and sociobiology. It should be in the library of every department of genetics, psychology, biology and sociology.

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THE SCIENCE OF GENETICS. W. Hexter and H. T. Yost, Jr. Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1976. Pp. 596+250 text-figures+tables. Hardback £10.85.

With a large format and little wasted page-space, this book is a solid and conventional introductory textbook of genetics aimed at the well-prepared American high-school student entering college.

The chief strength of this volume lies in its text which, although very wordy, is lucid and succeeds admirably in drawing out the varied significance of the examples discussed. Expecting the worst from its prolixity, I was pleasantly surprised by the number of times I found occasion to jot an appreciative comment in the margin at a particularly well-turned description, choice of approach or scrap of unusual and illuminating information. The discussion of what is really measured by attempts to determine mutation frequency (pp. 416-418) serves as a good example of these textual virtues, underlining the authors' skill in simplifying, yet not too much, without losing the essence of the science. An additional virtue is that the authors give adequate weight to both classical and molecular genetics and successfully integrate them into a coherent whole in which the historical interplay of their separate development is well-displayed alongside their interdependence.

Counterbalancing the virtues are a sizeable number of openings for criticism, mostly minor but substantial *in toto*. Bold-face type is used in the text for gene symbols, but the problems are spoiled by being printed in a single typeface. This suggestion of careless sub-editing is reinforced by a number of errors or misprints affecting figures, captions and problems,