REVIEW

THE GENETICAL BASIS OF SELECTION. By I. Michael Lerner. John Wiley and Sons, New York, and Chapman and Hall, London. 1958. Pp. 298+xvi. 64s.

This is the third book of Dr Lerner's that we have had the pleasure of reading. In the first, *Population Genetics and Animal Improvement* published nearly ten years ago (review: *Heredity*, 5: 293-296), he dealt broadly with the concepts, techniques and problems of the biometrical study of continuous variation. The second, *Genetic Homeostasis* published in 1954 (review: *Heredity*, 9: 273-274) was an essay on the phenomenon of inertia, or homeostasis, in population behaviour, which he sought to relate to stability in the development of individuals. Now he returns to the broader field with an account of selection and the genetical basis of response to it. As in the first book, Dr Lerner concerns himself largely with man-maintained populations of domestic species, especially chickens with which much of his own work has been done, and with the responses these populations show to artificial selection.

The first three chapters lay down the genetic foundation, dealing in turn with the notion of the mendelian population, with the principles and analysis of polygenic inheritance and with the properties of heritable variability in relation to population equilibria, optimal phenotypes, and inbreeding. The action of selection is next dealt with in four chapters, with special reference to the nature of the genetical variation and the methods of selection used. The final chapter looks at the prospects and needs of further experimental work. The text is amply illustrated by nearly a hundred graphs and diagrams. The treatment is delightfully and aptly described by the author where he says in his Preface ". . . the biological phenomenon of selection is approached without either the naturalist's disdain of or the mathematician's reverence for statistical formulation". Indeed much of the mathematics, as well as unessential but nevertheless useful references, are confined to a series of thirty "boxes" separable from but appropriately interspersed in the text which they elaborate and underpin. This device will doubtless be welcomed by the student and the reader who is less well versed in statistical matters, and it is not out of place in a book which aims, at least in part, at an expository treatment suitable for use as a text-book albeit at an advanced level.

One might cavil at certain features of the book. For example, it is not easy to see how type III selection (in fig. 1.1) where the extreme phenotypes are preferred can be fairly described as stabilising. Its stabilising effect will be predominant only under limited circumstances and for limited ranges of time. In general its effect should be at least as much disruptive as stabilising and over near evolutionary numbers of generations it would be wholly disruptive to the distribution of phenotypes. Again one might wonder whether the author is well advised to omit standard errors, even when he is aiming only to illustrate ideas, for without them it is impossible to arrive at a truly balanced assessment for any experimental situation. One may wonder too whether it is wise to confine the designation of selection to cases where it is genetically effective, rather than using it for any

process of discrimination among individuals as prospective parents while recognising that its effectiveness and consequences will vary with the causation of the differences among these individuals.

These and their like are, however, but minor cavils. They cannot obscure the essential worth of the book, containing as it does the best account of artificial selection, its relation to and its consequences for the genetical situation yet to be produced, and with so valuable an emphasis on points such as the economics of the selection procedures described in chapter 5. If one reads it without, perhaps, the full thrill of stimulation Dr Lerner's earlier books gave us it is because the early pioneering days are over : biometrical genetics as we know it is becoming orthodox and possibly a little staid. Indeed one gets the impression from his concluding pages that this is an opinion Dr Lerner would share. But be this as it may, in one respect there has been no change. The quality of the treatment and the mastery of the presentation in this, as in the earlier books, is a pleasure and a stimulus to us all.

KENNETH MATHER.