

REVIEWS

A CENTURY OF DARWIN. By S. A. Barnett *et al.* London: Heinemann. 1958. Pp. xvi+376. 30s.

A HANDBOOK OF EVOLUTION. British Museum (Natural History). London. 1958. Pp. ix+110. 5s.

A number of publications have appeared to celebrate the centenary of the Darwin-Wallace paper. These are two of very different kinds.

A Century of Darwin is a symposium by fifteen contributors which cover not unsuccessfully, but in a random order, the wide range of Darwinian studies. In their methods they also cover a wide range. Six of them are devoted to specific themes of Darwin: the Descent of Man, Sexual Selection, Animal Breeding, Expression of Emotions, Coral Reefs, and Palæontology are all most instructive. Heslop Harrison's account of the six plant books in which Darwin appears as an experimenter and a founder of population genetics is also highly topical. Articles by Le Gros Clark on Man and by de Beer on Development are particularly well illustrated.

These are aspects of Darwin's work about which there is least controversy. More disputable are his historical and sociological connections. We must expect a few injustices to Darwin's predecessors. It was Lamarck not T. H. Huxley who invented the word and partly the idea of biology (p. 122). Erasmus Darwin's greatest work on animals, *Zoonomia*, was in prose not verse (p. 1). Nor were his other works "long and unfortunately remarkably boring poems". The size of his *Temple of Nature* was due to its copious and closely reasoned scientific notes. Charles Darwin misrepresented these works without reading them, T. H. Huxley followed his example, and the practice has held for a century.

MacRae, writing on Social Sciences, supplies another dubious connection for he considers that Darwinism derived from Malthus. He does not consider that both might be derived from Erasmus Darwin. MacRae, turning from history to our present state, concludes that the social sciences need something other than, or more than "Darwinism". The last word in biology, he writes, is no longer the first word in sociology. But what is the last word in biology? There is no evidence that this writer knows it or is looking for it.

Four articles discuss recent genetic work. Dobzhansky is rich in recent research on species. Thoday considers the genetic properties of breeding groups in relation to natural selection. Waddington describes *Drosophila* experiments in which he found that selection under one set of conditions produced a genetic change which had a correlated effect under another, more normal, set of conditions. He does not, however, make it clear what other result might have been expected. Nor is it clear to me what bearing this result has on selection theory.

The most exciting of the articles is that entitled "The Third Stage of Genetics" by Dr Donald Michie of the Royal Veterinary College. Here important experiments are given a new or at least a newly connected interpretation. Briggs and King have shown by transplantation that nuclei change in the course of development in the frog. By transplantation also

Danielli has shown that nuclei change when they are put in a foreign cytoplasm. Dr Michie seems to think that these changes mean a modification of heredity. But does this follow? Could it not be the nucleoli which change? Is it not supposed that nuclear genes by interaction with the cytoplasm produce what some people call "plasmagenes" concerned with differentiation? And (on the lines Caspersson suggested in 1941) might these not be housed in the nucleolus on the way out?

Turning to experiments with plants, Michie quotes the Rye-Wheat example of the induced diffusion of a self-propagating particle. This consequence of grafting has been inferred in various plants over a period of thirty years (Hoffmann, F. W., 1927, *J. Agric. Res.*, 34, 673). So frequently indeed that I have used the expression *provirus* to cover the situation. The term has even been extended to apply to the somewhat different relation between stable or attached phage and the bacterium, a connection which Michie also seems to recognise.

So far in this third stage of genetics Dr Michie has been dealing with experiments which have been generally confirmed or supported by published work. They are text-book experiments. With these, however, he associates (so far as I understand his argument) two series of works which have not been confirmed. There is an experiment by Glavinic in Belgrade which is used to infer that grafted tomatoes will give progenies showing Mendelian ratios modified by the stock. It is a mistake, however, not to mention that attempts to repeat the earlier work on these lines of Glushchenko have failed, e.g. by Leo Sachs (1951, *Nature*, 167, 282-3), and by Hans Stubbe (1954, *Kulturpflanze*, 2, 185-236).

A similar mistake is made in quoting Benoit and others on the effects of DNA on ducks which is said to have "fired experimental biologists throughout the world" (p. 84). Perhaps, too, Dr Michie might have added to his discussion of Daniel's graft-hybrids references to the contrary opinions of workers who had experience of this kind of experiment. In this way the beginner, unfamiliar with the published work on his subject, may avoid being "fired" unnecessarily.

With these few words of caution (which will not be needed by most readers) *A Century of Darwin* may be warmly recommended.

Evolution is published as a handbook to the centenary exhibition, organised by Sir Gavin de Beer, which has this year transformed the central hall of the British Museum of Natural History. It is a popular and well illustrated account of the history of Darwinism, of the present views of evolution showing in detail the impact of recent genetic theory and experiment on them. It should be valuable for schools and the general reader. There is a list of references.

C. D. D.

NATURAL SELECTION AND HEREDITY. By P. M. Sheppard. London: Hutchinson. 1958. Pp. 212. 18s.

Natural Selection and Heredity together constitute a formidable subject. Dr Sheppard, in this relatively small book, tackles it by selecting a number of topics to illustrate the important principles. He begins with an admirable chapter on the history of the concept of natural selection in biology. There follow chapters on elementary genetics, including polygenic inheritance, on the evolution of dominance, mutation and genetic drift. A large section,