

PREFACE*

Post-Darwinian books on evolution fall naturally into four classes. I. Those which preach Wallaceism, as, for example, Wallace's Darwinism, Poulton's Essays on Evolution, and the voluminous works of Weismann. II. Those advocating Lamarckism. Cope's Factors of Evolution and the writings of Haeckel belong to this class. III. The writings of De Vries, forming a group by themselves. They advocate the theory that species spring suddenly into being; that new species arise by mutations from pre-existing species. IV. The large number of books of a more judicial nature, books written by men who decline to subscribe to any of the above three creeds. Excellent examples of such works are Kellog's Darwinism To-Day, Lock's Recent Progress in the Study of Variation, Heredity, and Evolution, and T. H. Morgan's Evolution and Adaptation. All four classes are characterised by defects.

Books of the two first classes exhibit the faults of ardent partisanship. They formulate creeds, and, as Huxley truly remarked, "Science commits suicide when it adopts a creed." The books which come under the third category have the defects of extreme youth. De Vries has discovered a new principle, and it is but natural that he should exaggerate its importance, and see in it more than it contains. But, as time wears on, these faults will disappear, and the theory of mutations will assume its true form and fall

* This is an edited, reformatted and augmented version of "The Making of Species" by Douglas Dewar and Frank Finn, published by John Lane, The Bodley Head, New York: John Lane Company, London, in 1909.

into its proper place, which is somewhere between the dustbin, to which Wallaceians would relegate it, and the exalted pinnacle on to which De Vries would elevate it.

In the present state of our knowledge, books of Class IV. are the most useful to the student, since they are unbiased, and contain a judicial summing-up of the evidence for and against the various evolutionary theories which now occupy the field. Their chief defect is that they are almost entirely destructive. They shatter the faith of the reader, but offer nothing in place of that which they have destroyed. T. H. Morgan's *Evolution and Adaptation*, however, contains much constructive matter, and so is the most valuable work of this class in existence.

Zoological science stands in urgent need of constructive books on evolution—books with leanings towards neither Wallaceism, nor Lamarckism, nor De Vriesism; books which shall set forth facts of all kinds, concealing none, not even those which do not admit of explanation in the present state of our knowledge.—It has been our aim to produce a book of this description.

We have endeavoured to demonstrate that neither pure Lamarckism nor pure Wallaceism affords a satisfactory explanation of the various phenomena of the organic world. We have further, while recognising the very great value of the work of De Vries, tried to show that that eminent botanist has allowed his enthusiasm to carry him a little too far into the realm of speculation. We have followed up the exposure of the weak points of the theories, which at present occupy the field, with certain suggestions, which, we believe, throw new light on many biological problems.

Our aim in writing this book has been twofold. In the first place we have attempted to place before the general public in simple language a true statement of the present position of biological science. In the second place, we have endeavoured to furnish the scientific men of the day with food for reflection.

Even as the British nation seems to be slowly but surely losing, through its conservatism, the commercial supremacy it had the good fortune to gain last century, so is it losing, through the unwillingness of many of our scientific men to keep abreast of the times, that scientific

supremacy which we gained in the middle of last century by the labours of Charles Darwin and Alfred Russell Wallace. To-day it is not among Englishmen, but among Americans and Continentals, that we have to look for advanced scientific ideas.

Even as the Ultra-Cobdenites believe that Free Trade is a panacea for all economic ills, so do most English men of science believe that natural selection offers the key to every zoological problem. Both are living in a fool's paradise. Another reason why Great Britain is losing her scientific supremacy is that too little attention is paid to bionomics, or the study of live animals. Morphology, or the science of dead organisms, receives more than its due share of attention. It is in the open, not in the museum or the dissecting-room, that nature can best be studied. Far be it from us to deprecate the study of morphology. We wish merely to insist upon the fact, that the leaders of biological science must of necessity be those naturalists who go to the tropics and other parts of the earth where nature can be studied under the most favourable conditions, and those who conduct scientific breeding experiments. Natural selection—the idea which has revolutionised modern biological science—came, not to professors, but to a couple of field-naturalists who were pursuing their researches in tropical countries. It is absurd to expect those who stay at home and gain most of their knowledge second-hand to be the pioneers of biological science.

We fear that this book will come as a rude shock to many scientific men. By way of consolation we may remind such that they will find themselves in much the same position as that occupied by theologians immediately after the appearance of the *Origin of Species*.

At that time theological thought was cramped by dogma. But the clergy have since reconsidered their position, they have modified their views, and thus kept abreast of the times. Meanwhile scientific men have lagged behind. The blight of dogma has seized hold of them. They have adopted a creed to which all must subscribe or be condemned as heretics. Huxley said that the adoption of a creed was tantamount to suicide. We are endeavouring to save biology in England from committing suicide, to save it from the hands of those into which it has fallen.

We would emphasise that it is not Darwinism we are attacking, but that which is erroneously called Neo-Darwinism. Neo-Darwinism is a pathological growth on Darwinism, which, we fear, can be removed only by a surgical operation.

Darwin, himself, protested in vain against the length to which some of his followers were pushing his theory. On p. 657 of the new edition of the *Origin of Species* he wrote: "As my conclusions have lately been much misrepresented, and as it has been stated that I attribute the modification of species exclusively to natural selection, I may be permitted to remark that in the first edition of this work, and subsequently, I placed in a most conspicuous position—namely, at the close of the Introduction—the following words: 'I am convinced that natural selection has been the main but not the exclusive means of modification.' This has been of no avail. Great is the power of steady misrepresentation; but the history of science shows that this power does not long endure." Notwithstanding this protest the Wallaceians continue on their course, and give to the world a spurious Darwinism. It is our belief that were Darwin alive to-day his sympathies would be with us, and not with those who call themselves his followers. It was one of Darwin's strong points that he never avoided facts. If new facts came to light which were incompatible with a theory of his, he promptly modified his theory. Since his death a number of new facts have come to light which, in our opinion, plainly indicate that the theory of natural selection as enunciated by Darwin needs considerable modification.

We have in this book set forth certain of these facts and indicated the directions in which the Darwinian Theory seems to require modification.

This volume originated as the result of several conversations we, the joint authors, had last summer. We discovered that we had a great many ideas in common on the subject of evolution. This seemed strange, seeing that our education had not been on the same lines. One of us took a degree in natural science at Cambridge, and subsequently entered His Majesty's Indian Civil Service, but continued his zoological studies in India as a hobby. The other, a naturalist from childhood, nevertheless took a classical degree at Oxford, then received a technical zoological training, adopted

zoology as a profession, and held for some years a position in the Natural History Museum at Calcutta.

Our conversations revealed that we were both of opinion that biology is in an unhealthy condition, especially in England, and that the science sorely needs some fresh impetus. Neither of us had the time to attempt, single-handed, to give the required impetus, but as one of us happened to be home on eighteen months' leave, we thought we might undertake the task in collaboration.

We felt that we might collaborate the more successfully because the large number of facts collected by the one of us form the necessary complement to the philosophical studies of the other.

We have endeavoured, so far as possible, to avoid technical terms, and have made a special point of quoting, wherever practicable, familiar animals as examples, in order that the work may make its appeal not only to the zoologist but to the general reader.

It may, perhaps, be urged against us that we have quoted too freely from popular writings, including those of which we are the authors. Our reply to this is that the study of bionomics, the science of living animals, occupies so small a place in English scientific literature that we have been compelled to have recourse to popular works for many of our facts; and we would, moreover, point out that a popular work is not necessarily inaccurate in its information.

In conclusion, we would warn the reader against the danger of confounding Inference with Fact. The failure to distinguish between the two has vitiated much of the work of the Wallaceian school of biologists.

Facts are always to be accepted. Inferences should be scrutinised with the utmost care.

In making our deductions, we have endeavoured to act without bias. We shall, therefore, welcome any new facts, be they consistent with, or opposed to, our inferences.