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‘Wallace’s “Darwinism.”’

That this is one of the most notable scientific books of the year goes without saying; that it might become without qualification one of the “books of the season,” as Mr Darwin’s own occasional green volume was wont to be, might also well be wished. For now that Mr Darwin is no longer with us, it is to Mr Wallace that we must do reverence as the Nestor of Biology; and this book of his is a fuller and more characteristic expression of his whole well-marked personality, from portrait frontispiece to final peroration, than any other of his preceding works. The encyclopædic knowledge of living nature, the lucid intellect which independently evolved the most impressive and influential theory of modern times, the pure unselfishness which now, as thirty years ago, despite a share of worldly success and scientific honour, of which the comparative smallness does little credit either to the world at large or to that of science in particular, suppresses even the slightest trace of self-assertion, the highest idealism which in the very face of this most sternly utilitarian of all theories yet battles to maintain the independence of the spiritual nature, are none of them common endowments; united they produce a type of the rarest kind, which the next generation will assuredly rate more highly than his own. And when in this volume we have at once a *resumé* of much of Mr Wallace’s earliest contributions to biology, combined with his most mature deliverances, and this on matters of general philosophy as well as of organic detail, the book becomes manifestly one which the general reader, not merely the professed naturalist, can ill afford to pass by. To “read the riddle of the painful earth” may not indeed be even for him, yet where is the shrewder guesser? And even if his solutions do not satisfy us (when did those of one generation satisfy the next?), and we have to face the Sphinx in turn, we shall none the less have reason to thank his master-colleague and himself, not only for teaching us half our solutions, but it may be in no small measure suggesting the remainder of them.

Even the preface is as characteristic of the man as of the book, and while keeping as far as possible to the latter, it is impossible to miss the gentle yet emphatic criticism of “the modern school of laboratory naturalists” made by this last of the great school of naturalist travellers, whose laboratory has been the world. For in biology, young though the science is, we take a thoroughly orthodox and conventional part in the farce-tragedy of education, and have no more begun to teach our science according to our Newton than did the mathematicians for a generation or two after theirs. Following the high, yet by no means highest, example of Professor Huxley (who albeit in some ways the typical exponent of evolution in general, and Darwinism in particular, has yet himself always been essentially interested, as he has recently told us, in the mere architectural and engineering structure of the separate type), we still for all practical purposes remain at the level of Vesalius or, at best, of Cuvier. We begin and end with the mere anatomy of a type-series; that is, we put one animal or plant corpse upon our student’s dissecting table after another, and seek to photograph each minutest detail upon the blurred and overloaded memory; but we do not initiate them, as Darwin and Wallace would have us do, into the intricate drama of living nature. Hence it is well to be reminded, in our author’s temperate way, that while “work in these departments is of the greatest interest and of the highest importance, it is not the kind of work which, by itself, enables one to form a sound judgment on the questions involved in the action of the law of natural

selection. These rest mainly on the external and vital relations of species to species in a state of nature—or what has been well termed by Semper the 'physiology of organisms' rather than on the anatomy and physiology of organs."

The book may be as fully recommended to those who wish to begin the study of evolution as to those who are interested in its contemporary discussion. For Mr Wallace brings forth things new and old; he restates the general arguments of the Origin of Species in a more simple, lucid, and readable way, and, at the same time, with the advantage of fresh illustration and more recent knowledge. He shows us the struggle for existence before entering upon the more difficult problems of variation; and instead of starting from variations under domestication, he extends our knowledge of variation in nature, and gives us graphic and statistical evidence both of its wide prevalence and of apparently its spontaneous and indefinite nature. He argues strongly, against Romanes, in favour of the utility of all specific characters; yet insists that all that was expected of Darwin was to explain the origin of *species—i.e.*, of the allied species of each genus; and while claiming for Darwin "that he is the Newton of natural history," and maintaining that the greater difference between genera, families, and orders are all of the same nature as those presented by species, and all can be explained by the action of the same general laws, he yet concedes that "the vertebrate animals, the mollusca, and the insects are so radically distinct…that objectors may not unreasonably doubt whether they can all have been derived from a common ancestor by means of the very same laws as have sufficed for the differentiation of the various species of birds or reptiles."

We need only note our author's exposition the struggle for existence, in so far that he sides with Darwin against Huxley's recent pessimistic reading of it (*Nineteenth Century*, February 1888); we may grant some weight to this, yet few will feel that it alters the essential interpretation to which all three naturalists stand committed, that of nature as "no better than a gladiator's show," to remind us that the gladiators felt little of either pain or terror.

For the multitude of interesting points with which Mr Wallace, like Mr Darwin, is wont to enliven and enforce his reasoning, we have little space, yet cannot wholly omit mention of one. The uniformly wingless insects of Kerguelen, one of the windiest and most shelterless of islands, came forward to support Mr Darwin's well-known explanation of the comparative winglessness of the Madeiran insect fauna, through the winged ones being always blown out to sea; we are shown species after species, here a bird, or there an insect in modification, to occupy new places in nature, and this even within recent times, like the sheep-eating parrot of New Zealand.

Passing over the discussion of the effects of isolation and of intercrossing, we find two fascinating chapters on the origin and uses of colour in animals, and on warning coloration and mimicry. In the chapter on colours and ornaments characteristic of sex we have an elaborate destructive criticism of Mr Darwin's well-known sexual selection, to which Mr Wallace has always been opposed, and this, as he maintains, from the side of the don and more comprehensive theory of natural selection; yet here appears a divergence far more profound than our author appears to have realised. The phenomena of male ornament are discussed and summed up as being "due to the general laws of growth and development, and make it unnecessary to call to our aid so hypothetical a cause as the cumulative action of female preference." Again, "if ornament is the natural product and direct outcome of superabundant health and vigour, then no other mode of selection is needed to account for the presence of such ornament." Granted; but does not Mr Wallace see that if the origin of characters so important as those often possessed by

males is to be ascribed to internal constitution rather than to external selection, the origin of this, that, and the other set of characters will next be explained in the same way as heretics are now actually doing? In pulling down the theory of sexual selection in favour of that of

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natural selection, Mr Wallace has really handed over Mr Darwin's elaborate artwork to the enemy, who will not long fail to see its value for a new assault.

The special colours of plants are next discussed, and at the outset Mr Wallace sees far more clearly than Mr Darwin or Mr Spencer how chlorophyll and its modifications, to which we owe the hues of spring and autumn, are "due to the chemical constitution of the organism; as colours they are unadaptive, and appear to have no more relation to the well-being of the plants themselves than do the colours of gems and minerals." Granted; but does not this seriously weaken his subsequent adherence to the accepted Darwinian view that the colours of flowers or fruit essentially owe their origin to the cumulative agency of selection by the insects, birds, or mammals they respectively happen to attract? The fact of adaptation, at least in a great number of cases of course, will not, of course, be denied, but the independent origin of the colour through the constitutional physiological changes of chlorophyll is henceforth, at anyrate, Mr Wallace must admit, incapable of disproof.

Mr Wallace, however, carries the war into the enemy's country, and vigorously replies to the recent criticisms of Darwinism, specially discussing those of Spencer, Cope, Hemper, and the present writer. He approves, however, of Weismann's theory of heredity, with its ultra-Darwinian insistance upon natural selection.

It is only possible, in conclusion, without comment to call attention to the final chapter, in which Mr Wallace enunciates his characteristic difference from Darwin. "I fully accept Mr Darwin's conclusion as to the essential identity of man's bodily structure with that of the higher mammalia, and his descent from some ancestral form common to man and the anthropoid apes. The evidence of such descent appears to me overwhelming and conclusive… The point to which I wish specially to call attention is that to prove continuity and the progressive development of the intellectual and moral faculties from animals to man is not the same as proving that their faculties have been developed from natural selection; and this last is what Mr Darwin has hardly attempted, although to support his theory it was absolutely essential to prove it… It is not, therefore, to be assumed without proof, and against independent evidence that the later stages of an apparently continuous development are necessarily due to the same causes only as the earlier stages. Applying this argument to the case of man's intellectual and moral nature I propose to show that certain definite portions of it could not have been developed by variation and natural selection alone, and that therefore some other influence, law, or agency is required to account for them." … For this "origin we can only find an adequate cause in the unseen universe of spirit."

Here then our author parts company with Mr Darwin for that of his old antagonist Mr Mivart. It is the beginning of new developments in a still far from ended controversy.

Darwinism, An Exposition of the Theory of Natural Selection, with some of its applications. By Alfred Russel Wallace. London, Macmillan. 1889.