
DARWINISM.*

DOES the fable of "The Three Black Crows" still lurk in any elementary reading-book? Or does a certain round game ("Russian Scandal" it used to be called) still relieve the dreariness of certain drawing-rooms? A statement or short tale is written down by number one, and then whispered to his neighbour, and so it goes round the circle, and in its final shape is compared with the original; the unlikeness is generally ludicrous and startling. So it has been with Darwinism. In some of its phases it has got beyond all recognition; it is totally unlike the simple theory that left the hands of its author. We do not refer to the extreme stage to which it has been carried by Haeckel and other Continental biologists; that may be regarded by some as the natural and logical outcome of the original Darwinian theory. In popular treatises, in magazine articles, in

* *Darwinism: an Exposition of the Theory of Natural Selection; with some of its Applications.* By Alfred Russel Wallace, LL.D., F.R.S., &c. London: Macmillan & Co. 1889.

polemics, in the expositions of professed disciples, and in the attacks of prejudiced opponents, Darwin's theory of "the origin of species by means of natural selection and the preservation of favoured races in the struggle for life" has in too many cases been completely misrepresented and travestied. Not only so, but ambitious young biologists, professing the profoundest reverence for the man they call master, but with an ill-concealed and not altogether illegitimate hope that the world may vote them into his place, have picked holes in the theory that took the thinking world by storm, have more or less directly tried to prove that it is inadequate, and that something they have hit upon is the very thing Darwin was in search of, but failed to find. One of the latest of these theories was propounded with a great flourish of trumpets; Darwin, we were told, was "played out"; his theory had served its purpose, and must take a subordinate place to the new hypothesis which was to solve all the puzzles of Nature. True, we were told that the new theory was only meant to be supplementary to that of Darwin; but if accepted as propounded, then Darwin had gone seriously astray. But we need not slay the slain.

Thus the mass of intelligent people interested in the progress of science have either been sorely puzzled or have imbibed the most defective and erroneous notions of what Darwinism really is. To correct these notions, to give a clear and simple exposition of what is the Darwinism of Darwin, is the task which Mr. Wallace has set himself, and which he has accomplished with a success which probably no one else could attain. Mr. Wallace's peculiar relation to Darwinism specially fits him for the service he has performed to his old friend and to the more thoughtful section of the reading public. It can never be forgotten that the two men, living on opposite sides of the world, quite unknown to each other, and quite ignorant of each other's pursuits, propounded simultaneously a theory of the origin of species which was practically identical. But there was no rivalry between them. While Mr. Wallace continued to work on his own lines, and to make valuable contributions to the new theory, he loyally acknowledged that the elaboration of its salient features could not be in better hands than those of the man who could afford to make it his life-work. With equal loyalty he comes forward now to tell us what Darwin's theory really is. He does not hesitate to supplement Darwin's illustrations with further facts, nor even to indicate the very few points in which he differs from some of the applications of the theory; but the book, as a whole, may be taken as a *résumé* of the volumes in which Darwin propounded and illustrated the doctrine which goes by his name. Mr. Wallace's volume may be taken as a faithful exposition of what Darwin meant. It is written with perfect clearness, with a simple beauty and attractiveness of style not common to scientific works, with a dignity and freedom from anything like personal bitterness worthy of Darwin himself, and with an orderliness and completeness that must render misconception impossible.

Mr. Wallace begins by recalling the precise title of Darwin's great work, which we have given above, and which ought to be constantly borne in mind. He then briefly tells us what attempts had previously been made to solve the great problem of the origin of species by Lamarck and others, and we do not remember to have seen the various stages so clearly stated, and the distinction pointed out between these and the solution advanced by Darwin, which at once commended itself to all inquirers in the same field, and within a marvellously short time almost revolutionized our ways of looking at the universe. He then, with admirable precision, clearness, and brevity, states what the theory of Natural Selection really is. The passage is worth quoting as a specimen of Mr. Wallace's style, and as an authoritative statement of the theory:—

The theory of Natural Selection rests on two main classes of facts which apply to all organized beings without exception, and which thus take rank as fundamental principles or laws. The first is, the power of rapid multiplication in a geometrical progression: the second, that the offspring always vary slightly from the parents, though generally very closely resembling them. From the first fact or law there follows, necessarily, a constant struggle for existence; because, while the offspring always exceed the parents in number, generally to an enormous extent, yet the total number of living organisms in the world does not, and cannot, increase year by year. Consequently, every year, on the average, as many die as are born, plants as well as animals; and the majority die premature deaths. They kill each other in a thousand different ways; they starve each other, by some consuming the food that others want; they are destroyed largely by the powers of nature—by cold and heat, by rain and storm, by flood and fire. There is thus a perpetual struggle among them which shall live and which shall die; and the struggle is tremendously severe, because so few can possibly remain alive—one in five, one in ten, often only one in a hundred, or even in a thousand. Then comes the question, Why do some live rather than others? If all the individuals of each species were exactly alike in every respect, we could only say it is a matter of chance. But they are not alike. We find that they vary in many different ways. Some are stronger, some swifter, some harder in constitution, some more cunning. An obscure colour may render concealment more easy for some, keener sight may enable others to discover prey or escape from an enemy better than their fellows. Among plants the smallest differences may be useful or the reverse. The earliest and strongest shoots may escape the slug; their greater vigour may enable them to flower and seed earlier in a wet autumn; plants best armed with spines or hairs may escape being devoured; those whose flowers are most conspicuous may be sooner fertilized by insects. We cannot doubt that, on the whole, any beneficial variation will give the possessors of it a greater probability of living through the tremendous ordeal they have to undergo. There may be something left to chance; but, on the whole, *the fittest will survive*.

The second chapter of the book is devoted to illustrations of the struggle for existence. This concludes with an eloquent and

touching section on the ethical aspect of the struggle. But, however fine the passage may be, it must be pointed out that Mr. Wallace has here allowed himself to wander from the subject, and to introduce considerations which have no bearing on the Darwinian theory. One of the most instructive and suggestive chapters is that which follows—"The Variability of Species in a State of Nature." Mr. Wallace points out that people generally—and it was so to some extent with Darwin himself—have no idea of the extent to which variations occur among individuals of the same species; it is hardly possible to find two individuals among the same progeny that precisely resemble each other. This has been quite recently proved in the most precise manner by an American naturalist, and Mr. Wallace illustrates the subject by a large number of diagrams, which are a great help to the understanding of the text. "Individual variability is a general character of all common and widespread species of animals or plants; and, further, this variability extends, as far as we know, to every part and organ, whether external or internal, as well as to every mental faculty." Variations are thus more widespread and occur far more rapidly than Darwin himself supposed; and the importance of the fact will be recognized when it is remembered how fundamentally important is the factor of variation in the basis of Darwin's theory.

But it is unnecessary to follow Mr. Wallace throughout all the chapters in which he summarizes, expounds, and illustrates the varied researches of Darwin in applying and amplifying his theory. Four chapters are devoted to colour and ornamentation in their many aspects. Another deals with the Geographical Distribution of Organisms, which is Mr. Wallace's own special subject. In another he examines the geological evidence of evolution. One chapter deals very fully with difficulties and objections, in which such topics are discussed as difficulty as to smallness of varieties; as to the right variations occurring when required; the beginnings of important organs; origin of the eye; instability of non-adaptive characters, and so on. In another chapter, on Fundamental Problems in relation to Variation and Heredity, Mr. Wallace discusses the various theories that have been advanced as modifications of Darwin's theory, or supplements to it, or substitutes of more or less important aspects of it, advanced by such writers as Mr. Herbert Spencer, Professor Geddes, Mr. Romanes, Dr. Weissmann, and others. He shows, very satisfactorily in our estimation, that the proposed substitutes cannot stand, that the proposed supplements to Darwin's theory are either based on misconceptions of what that theory is, or are only part of the material utilized by the forces which the theory calls into play.

One word must be said about the last chapter, which to many readers will be the most interesting of all—"Darwinism applied to Man." It is well known that Darwin and Mr. Wallace did not agree as to the influences that have been at work to raise man to his present advanced stage of development, that have enabled him to shoot far ahead of those lower animals with which he stands in such close physical relationship. Darwin maintained that it was unnecessary to call in any other forces than those implied by his theory—those which have been at work from the beginning to produce the immense variety which now exists among organized beings. Mr. Wallace, on the other hand, maintains that, to account for man's mental and spiritual nature, some other force must have come into play at a certain stage of his development; and it is commonly thought that he believes that force to be of a supernatural character. But the last chapter—which in some respects will appear to the unprejudiced thinker unsatisfactory and not throughout scientific in its reasoning—seems to us clearly to obviate this objection, if at least we may judge from the analogy which Mr. Wallace introduces. The sort of force which he thinks must come into play at a certain stage of man's career upwards, he tells us, probably held the same relation to Natural Selection that the Glacial epoch did to the ordinary forces of heat and cold, rain and sunshine, rivers and ocean, in sculpturing the face of the land. True, he maintains that glaciation is different in kind from these other forces; the ordinary physical geographer, however, usually, classifies them all under the same category. At the same time the spiritual world, the origin of which Mr. Wallace cannot believe is accounted for by Darwinism, is in his idea of a much more comprehensive character than is usually maintained. Still the concluding chapter will have its uses, and will bring consolation to many who would fain believe in Darwinism, but fear lest that might involve the renunciation of their faith:—

Those who admit my interpretation of the evidence now advanced . . . will be relieved from the crushing mental burthen imposed upon those who—maintaining that we, in common with the rest of nature, are but products of the blind eternal forces of the universe, and believing also that the time must come when the sun will lose his heat and all life on the earth necessarily cease—have to contemplate a not very distant future in which all this glorious earth—which for untold millions of years has been slowly developing forms of life and beauty to culminate at last in man—shall be as if it had never existed; who are compelled to suppose that all the slow growths of our race struggling towards a higher life, all the agony of martyrs, all the groans of victims, all the evil and misery and undeserved sufferings of all the ages, all the struggles for freedom, all the efforts towards justice, all the aspirations for virtue and the wellbeing of humanity, shall absolutely vanish, and, "like the baseless fabric of a vision, leave not a wrack behind."

"C'est magnifique, mais ce n'est pas science."