BOOK REVIEWS.

Darwinism.*

Probably no single individual in the history of the world has done so much to modify public opinion regarding many matters of scientific interest as did the late Charles Darwin, and views which he propounded regarding natural selection "have passed," says a recent reviewer, "from the domain of speculation into the realm of absolutely demonstrated fact." As is well known, the radical changes of opinion respecting the origin and evolution of species through natural selection met with much violent opposition when first proposed by Darwin, but the theory probably received as much injury from its too zealous admirers as it did from its avowed enemies. It was the enthusiastic advocates who "out Darwined Darwin," and attempted to make it explain everything, much more, in fact, than its originator ever claimed for it. But the strong light of scientific criticism has proved alike its merits and its fallacies. The work before us is a restatement of the problem, and a presentation of the additional proof which active investigation has brought forward during the past twenty years. Alfred Russel Wallace, the now venerable author, enjoys with Darwin the honor of having arrived, independently and almost simultaneously, at the same conclusions, but the book is not marred by the bitter personalities that in cases of similar nature have been the *raison d'etre*. It is a conscientious, dignified presentation of facts and is filled with the warmest praise of Darwin's work. Darwin wrote for a generation who did not deem it possible that species could be developed from species by any natural law of descent, while the present generation only differ in regard to the various details of the process, the main fact being indisputably and well nigh universally accepted. The fact that Darwin employed domesticated animals and plants for proof of descent by natural selection has always been regarded as a weak point, but Wallace has here presented a mass of highly instructive facts regarding animals and plants in a wild state. The facts, which are admirably summarized by diagrams, show that in the normal wild state the various organs of plants and animals vary to an astonishing degree. A large series of common species of birds, for example, taken at the same place and at the same time, show great variation from the type in essential characters, such as length of wing, tail, and claws, length and thickness of beak. The internal organs also exhibit a strong variation. The further objection, that not a sufficient number of individuals vary in a particular direction at the same time to establish a new race, is answered by these same facts, for it was shown in the case of the birds that a number of individuals taken at the same time have long wings correlated with long tails, or short wings and long beaks. Now, if an occasion should arise, such as a change of climatic or terrestrial conditions, whereby it would be of vital advantage for a bird to have longer wings, it has been shown that at least ten out of a series of fifty-eight specimens already possess this advantage, and if this proportion be multiplied by the thousands of individuals that go to make up a species in any locality, it is seen that there will always be enough at any time to take up and benefit by the change. After slight varieties are once established it is claimed that they are likely to be swamped by crossing with the parent stock, and Romanes has proposed the theory of physiological selection, which supposes that there is a physiologically-developed sterility with the parent, but Wallace shows clearly that while this may undoubtedly have an appreciable effect, it is by no means always a necessary explanation. Suppose a slight variety of a plant was produced by the extension of a forest species out on a plain, it would meet with new enemies and such changed conditions that it would be brought to the flowering condition at a different time than the parent and would thus be prevented from being swamped by it. The same takes place with color-races of animals, those of the new slight variety refusing to mate with the differently colored parent stock. The subordination of natural selection to the laws of variation, of use and disuse, of intelligence, and of heredity, have all been urged against it. As it will be impossible to go further into the merits of this most admirable exposition, it will perhaps be well to give, in the language of the author, the further subjects of novelty or interest that are discussed in this volume. They are: "(1) A proof that all *specific* characters are (or once have been) either useful in themselves or correlated with useful characters; (2) a proof that natural selection can, in certain cases, increase the sterility of crosses; (3) a fuller discussion of the color relations of animals; (4) an attempted solution of the difficulty presented by the occurrence of both very simple and very complex modes of securing the cross fertilization of plants; (5) some fresh facts and arguments on the wind-carriage of seeds, and its bearing on the wide dispersal of many Arctic and Alpine plants; (6) some new illustrations of the non-heredity of acquired characters; (7) a new argument as to the nature and origin of the moral and intellectual faculties of man." The work contains a fine engraving of Mr. Wallace, and many figures and maps in the text, and is printed in the clear, attractive style characteristic of Macmillan's publications.

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*Darwinism; an Exposition of the Theory of Natural Selection, with Some of its Applications. By Alfred Russel Wallace. London and New York: Macmillan & Co.