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**SCIENCE**

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*Contributions to the Theory of Natural Selection: a Series of Essays.* By Alfred R. Wallace. (Macmillan & Co.)

IN this volume of reprinted and augmented essays, Mr. Wallace aims at establishing and recording his claims as an early speculator on the Origin of Species, by what Mr. Darwin afterwards termed "Natural Selection." There can be no question that Mr. Wallace had the merit of being the propounder of such a doctrine, and that another author he does not name, Mr. Herbert Spencer, likewise propounded the theory of the "Survival of the fittest," while to Mr. Darwin alone belongs the credit of elaborately and continuously working out the similar doctrine of "Natural Selection," be it well or ill founded.

By the first essay, reprinted from a magazine of restricted circulation, Mr. Wallace fully vindicates his claim as an independent speculator in the direction specified while he was at Sarawak in 1855; and, by the additional essays, he shows the growth of thought upon and around his original conceptions, until he has become one of Mr. Darwin's strongest supporters and ablest defenders, by means of minute and multitudinous observation in various departments of zoology. With men like Mr. Darwin and Mr. Wallace, who have devoted many years to patient study under very favourable circumstances, the ordinary naturalist cannot cope in collecting and marshalling whole troops of facts and phenomena; yet he may fairly estimate the value of their own conclusions and test the force of their arguments. Many may welcome this volume, and cherish

respect for its author and admit the accuracy of his observation, who, nevertheless, will see weak points in his reasoning, and differ materially from some of his most important views. The true merit of such men is the sagacious and zealous accumulation of a large series of facts in Natural History, which may be registered for use and reasoning by other minds, at least as capable of reasoning rightly as their own.

In an essay, entitled 'Creation by Law,' Mr. Wallace combats at some length nearly one-half of the Duke of Argyll's well-known book, 'The Reign of Law,' endeavouring to show that the Duke's own views lead to conclusions as hard to accept as any which he imputes to Mr. Darwin. To say that Mr. Wallace is as able as the Duke is little to the purpose; for this great question is inadequately treated by both. A counter-statement of equivalent difficulties is not the establishment of truth, but merely literary fencing. Suppose the difficulties on either side to be equal, and we are merely where we were: the Duke finds difficulties in Mr. Darwin, and Mr. Wallace finds difficulties and discrepancies in the Duke. Is this a mere question of preponderance of difficulties? If so, any reasoner may take his choice without blame and without advantage. To demolish a Duke is one thing,—to build up a system is quite another.

Mr. Wallace attempts to meet some of the more popular arguments against Natural Selection; but, as it will appear to many, occasionally by advancing as truth what is not really admitted as truth. Thus, for example, on the question of Beauty in Creation, his statements are questionable. "Mr. Darwin," he says, "has lately arrived at the wonderful generalization that flowers have become beautiful solely to attract insects to assist in their fertilization." Not a few will think this, indeed, to be a *wonderful* generalization: and when he further adds, in commenting on Mr. Darwin, "But much more is proved; for where beauty is of no use to the plant, it is not given. It cannot be imagined to do any harm. It is simply not necessary, and is therefore withheld,"—one can only marvel at such a "wonderful generalization." How strange, too, that in a system of pure naturalism, in which Contrivance and Interference and Purpose are particularly objectionable, beauty is given or withheld according to use. The inconsistencies of a ducal author are of small consequence; but objectors should at least be consistent with themselves. Mr. Wallace's remarks upon beauty and ugliness in creation, with reference to the Creator's mind, cannot commend themselves to a sound and impartial thinker; and as much might be said of some other portions of his theoretic advocacy.

In exposing the weakness of an article in the *Times* newspaper against Natural Selection, Mr. Wallace declares that the doctrine is "so absurdly misrepresented that it would be amusing, did we not consider the misleading effect likely to be produced by this kind of teaching in so popular a journal." The value of this essay lies in the clearer exposition of what Natural Selection is really presumed to signify. Thus far, as an expounder of Darwin and his doctrine, this author is worthy of perusal. So difficult has it been to discover what is precisely meant by this hypothesis, to what extent it reaches, and how much is positively claimed

for it, that its opponents have long found themselves at a great disadvantage. What some have inferred to be part of it has been subsequently disclaimed; and so much mere fencing has taken place that we are thankful to find a few clear and intelligible elucidations of it in this volume. In this respect, the two essays on the Action of Natural Selection on Man, and the Limits of Natural Selection as applied to Man, are good and useful. The latter is one of the best in the volume, and appears to be new. Here the author argues fairly and candidly, and sees objections without ignoring them.

As fully applied to Man, the doctrine of Natural Selection is surrounded with great difficulties. The brain of the lowest savages, and so far as we know, of the prehistoric races, is and was little inferior in size to that of the highest types of man, but immensely superior to that of the higher animals; while it is universally admitted that the quantity of brain is one of the most important, and probably most essential, of the elements which determine moral power. Yet the mental faculties of savages are very little above those of animals. How can this be consistent with Natural Selection, which, by hypothesis, could only have endowed savage man with a brain a little superior to that of the ape? How comes it that the savage really possesses a needless quantity of brain? Certainly not by any hypothesis of development or selective modification. No one sees this and states this more clearly than Mr. Wallace; and now let us quote a sentence or two from him: "The inference I would draw from this class of phenomena is, that a superior intelligence has guided the development of man in a definite direction, and for a special purpose, just as man guides the development of many animal and vegetable forms. In these few cases a controlling intelligence has directed the action of the laws of variation, multiplication, and survival for his own purposes. We know that this has been done; and we must, therefore, admit the possibility that, if we are not the highest intelligences in the universe, some higher intelligence may have directed the process by which the human race was developed by means of more subtle agencies than we are acquainted with. At the same time, I must confess that this theory has the disadvantage of requiring the intervention of some distinct individual intelligence to aid in the production of what we can hardly avoid considering as the ultimate aim and outcome of all organized existence—intellectual, ever-advancing, spiritual man. It therefore implies that the great laws which govern the material universe were insufficient for his production, unless we consider (as we may fairly do) that the controlling action of such higher intelligences is a necessary part of those laws, just as the action of all surrounding organisms is one of the agencies in organic development." Thus cautiously and reservedly does a thorough Darwinian approach towards a Creator and a special creation of Man!

So unpopular is simple creative and directive theism with a certain class of naturalists that Mr. Wallace almost starts at the shadow he himself hath made. He fears his opinion may be scornfully rejected; and, in his concluding page, he remarks: "The objections which in this essay I have taken to the view that the

same law which appears to have sufficed for the development of animals has been alone the cause of man's superior physical and mental nature, will, I have no doubt, be overruled and explained away; but I venture to think they will, nevertheless, maintain their ground, and that they can only be met by the discovery of new facts or new laws, of a nature very different from any yet known to us."

Differing as we do from Mr. Wallace respecting the verity and value of the hypothesis of Natural Selection, we yet commend his volume to attention as very instructive, if not very novel; and we are sure that no naturalist will peruse it without increased respect for its author and his disinterested labours in Natural History. Let it be added, that his style is simple and unpretending.