

*WALLACE ON NATURAL SELECTION*

*Contributions to the Theory of Natural Selection. A Series of Essays. By Alfred Russel Wallace. (London: Macmillan and Co., 1870.)*

IN the discussions of the French Academy, to which we referred in a recent number, M. Elie de Beaumont ventured to describe Mr. Darwin's theory as *La Science Mousseuse*. The phrase is a good one, and expresses very happily the kind of work for which some of the speakers in that debate are distinguished. But although we too in England are not unacquainted with this kind of popular science, scientific works do from time to time appear which are popular without being frothy, and to this class the present book belongs. While strictly accurate in matter, it is easy in style, and is so free from technical language, that it may be understood by educated men who are not professed naturalists; so that we hope it will be read by a large number of those to whom Mr. Wallace's delightful volumes have made the Malay Archipelago familiar.

The arrangement of the essays (most of which have been published separately) does not, perhaps, bring out their mutual connection so well as might be, and there is no attempt to blend them into a continuous series. Four main subjects are discussed, and each has its own peculiar interest.

The first and second chapters are reprinted as originally written in the East Indies, and, with the eighth, form Mr. Wallace's contribution to the theory of natural selection in general. It is remarkable that the same pregnant idea which Mr. Darwin has for ever united with his name should have occurred independently to another English naturalist on the other side of the globe. The public opinion of the scientific world will no doubt assign Mr. Wallace the full credit which the preface to this volume so modestly claims; and the highest respect is due to his varied and fruitful labours in both hemispheres; but a warmer feeling than respect will be paid to the spirit by which the following passage was prompted:—"I have felt all my life, and I still feel, the most sincere satisfaction that Mr. Darwin had been at work long before me, and that it was not left for me to attempt to write 'The

Origin of Species.' I have long ago measured my own strength, and know well that it would be unequal to the task. Far abler men may confess that they have not that untiring patience in accumulating, and that wonderful skill in using, large masses of facts of the most varied kind—that wide and accurate physiological knowledge, that acuteness in devising and skill in carrying out experiments, and that admirable style of composition, at once clear, persuasive, and judicial—qualities which in their harmonious combination mark out Mr. Darwin as the man, perhaps, of all men now living, best fitted for the great work he has undertaken and accomplished."

The third chapter is on so-called Mimicry among Animals, and contains an account of some of the remarkable cases of dimorphism observed by the author and by Mr. Bates, and of those in which one species closely resembles not only leaves and inanimate objects, but other specially protected animal forms. The facts thus established are explained with great ingenuity, and often with equal probability, by the operation of the natural laws of selection. The ways in which even brilliant colouring may become a means of protection are well illustrated, so that this branch of study is made to yield support instead of difficulty to the Darwinian theory. The following chapter, the only technical one in the book, is an application of the same law to explain the various forms and distribution of the group of *Papilionidae*. It may be compared with Fritz Müller's study of the Crustacea from a similar point of view; and we believe that more solid progress will be made by carefully working out the application of natural selection to restricted and well-known animal groups than by attempting the construction of more comprehensive and imposing phylogenies.

In the seventh chapter Mr. Wallace makes a somewhat similar inquiry into the relation of the colour of birds to the form of their nests, and concludes, from a very wide survey, that when the female is of conspicuous colours, the nest is adapted to conceal her during incubation, while open nests are made by those already sufficiently protected. The exceptions to the rule are candidly stated, and most of them satisfactorily met. That the true law of the habit has been discovered is, perhaps, too much to say; but the evidence is at least enough to lead to further investigation on this interesting subject. Another essay, styled, not very happily, "The Philosophy of Birds' Nests," attempts to explain the building of nests and also the song of birds as the result not of "instinct," but of conscious imitation; gradual improvement being of course brought forward by the survival of the most skilful architects and the constant sexual demand for the best musicians. But not only does Mr. Wallace thus raise nest-making to the rank of an intelligent art, he also shows how much of human construction is simply imitative, and therefore as fairly to be called instinctive as a bird's; while in another passage he shows how the alleged wonderful displays of instinct in savages are really the result of habit and of reason.

This chapter on Instinct in Men and Animals would naturally introduce the last two, in which the working and the limits of the law of natural selection on the human race are considered. This is probably the most difficult,

as it is certainly the most generally interesting, of the questions affecting the origin of animal species. Those who are not satisfied with the genealogies of Haeckel, and wait for the more cautious and philosophic conclusions expected from the master of the subject, will scarcely, we think, accept the views propounded in this volume by Mr. Wallace. He points out very clearly how most of the human peculiarities of structure may be supposed to have originated by the survival of the forms fittest for their mode of life, and is fully aware of the necessary change going on at the same time in the various functions, to bring them also into harmony with structure. And he shows with great justice how mental and moral qualities must interfere with the absolute carrying out of the law of natural selection—not only in civilised communities, where it is continually and designedly contravened, but among all savages who take, for instance, the least care of the sick and aged of their tribe. But, beside and apart from the operation of the general law of organic life, with these various modifications and restrictions, Mr. Wallace believes that another and independent cause has been at work in the evolution of the human frame, and that this has been a supernatural one. He maintains that the large size of the brain in man, the scantiness of his hairy covering, the great specialisation of his extremities, and some other peculiarly human characters, cannot be explained, except as the result of the direct action of the Creator's will. In fact, he compares man as he at present exists with such products of artificial human selection as the seedless banana or the London dray-horse; so that, if we may thus express Mr. Wallace's theory, man is God's domestic animal.

A great deal of the metaphysical discussion which occupies the last pages of the volume, including the verses quoted from an American poetess, has, we confess, to our mind, the same "double disadvantage" which the author finds in "the law of unconscious intelligence pervading all organic nature put forth by Dr. Laycock, and adopted by Mr. Murphy," that, namely, of being "both unintelligible and incapable of proof;" but the theory of divine artificial selection supplying the deficiencies of natural selection in the formation of man may, we think, be at once met by the following considerations.

The theory of natural selection does not suppose a kind of large female divinity, whose name is Nature, and whose function is to select from animals and plants those fittest for survival. The theory rests, as Mr. Wallace, in another part of his work, is careful to remind the reader, on certain proved facts (enumerated at p. 302), which necessitate the survival of certain forms by virtue of the proved physical laws which we see in daily operation. But these so called laws are, to all who believe in a Creator, simply the manner of His action. To say that our brains were made by God, and our lungs by natural selection, is really to exclude the Creator from half His creation, and natural science from half of nature. All the phenomena we know are of necessity ultimately referable to the First Great Cause: the object of science is to discover their secondary causes; and if the theory of natural selection does not explain how the larynx or the brain of man were developed, then we must try to find another which will. To fall back for explanation upon the primary

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efficient cause of their existence and the design with which they were framed, is only to confuse two distinct branches of inquiry.

At present, however, we may be content to see how far we can work the Darwinian hypothesis, and can only hope that there may be other "contributions" to the theory as interesting and valuable as these of Mr. Wallace.

P. S.

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