

adaptation through survival of the fittest, but that far higher mentality which foresees all possible results of the constitution of our cosmos."

Again, referring to the adaptations between life and the physical laws of the solar system which render life possible, and after expressing his belief that on no other planet than the earth can the development of organic life take place, he says:—

"These afford, in my opinion, an exceedingly powerful argument for an over-ruling MIND, which so ordered the forces at work in the material universe as to render the almost infinitely improbable sequence of events to which I have called attention an actual reality."

The author devotes a chapter to "recognition marks" in birds and mammals, *i.e.*, the characteristic plumage or colouring borne by each individual of a species. He believes that these are means of identification and that they are also of use in the formation of new species, the tendency being for varieties of the higher animals to mate with their like. This is true, but the mating is more probably the result of pre-existing companionship in which individuals come to recognize the *tout ensemble* of characters rather than special markings. Regarded as means of identification, they are probably, in most instances, of much less importance than scent.

Whenever a scientific observer permits his hopes or feelings to influence his judgment, there is a danger of the verdict being against the weight of evidence properly admissible. Dr. Wallace provides several instances of this. He protests against the treatment of disease by antitoxin, but he has never had the experience of treating a disease such as diphtheria or snake-bite with and without it. He describes vivisection as brutalizing and immoral; the point is, has it been of service to man? He devotes a chapter to the question, "Is Nature cruel?" Our answer would be that she is concerned with neither pain nor its opposite; her only business is the evolution of the highest types. It is curious to notice how convinced the author is, like Voltaire's Dr. Pangloss, that—for its purpose, *viz.*, the development of man—this is the best of all possible worlds, and that the course of organic evolution, so far as we know it from the past, could not, for that reason, have been otherwise. A more plausible explanation of the occurrence and passing away of the gigantic reptiles and mammals of earlier epochs, to the description of which Dr. Wallace gives much space, is that they were Nature's failures, and so became extinct. It is also questionable whether man in his present state of evolution—to judge by the past—is the final product of the universe.

Apart from his solution of some of the controversial subjects alluded to, Dr. Wallace has produced, indeed, a *tour de force*, and we heartily congratulate him upon its achievement. It is written with all the force and vigour of his earlier works, and affords striking testimony of the value of a life devoted to science, both in its usefulness to mankind, and, we may add, in the production of longevity.

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*The World of Life.* By Alfred Russel Wallace. (Chapman & Hall.)—No one to whom the author was unknown would for a moment suspect that this volume was the work of a man close upon his eighty-eighth year; it is so fresh, stimulating, and clear that the writer seems sometimes almost boyish in his enthusiasm and faith. Fifty years ago there was nothing but antagonism between religion and science; now both sides seem able to hold out the olive-branch. Sir Oliver Lodge has recently expressed the conviction—and in the present volume Dr. Wallace does the same—that Science can go beyond her negative attitude. Both these observers, though trained in different fields, believe that the purpose of the universe is the education and development of mankind for an enduring spiritual existence. In the last resort, this must be a matter of faith—it cannot be demonstrated; and to some minds faith and conviction come more easily than to others. But Dr. Wallace gives here the reasons which, after half a century of thought and work upon the Darwinian theory of evolution, have led him to this belief.

The sub-title of the volume is 'A Manifestation of Creative Power, Directive Mind, and Ultimate Purpose,' and the author's object is, if possible, to discover proofs of this in nature. With this in view he begins with a detailed account of the distribution of plants and animals in the world, and as shown in past ages by the geological record. He believes that the surface-changes of the earth form the motive-power of organic evolution, the guiding force of which is natural selection acting by means of the laws of heredity, variation, and increase, and the consequent survival of the fittest. But Dr. Wallace's convictions enable him to carry the analysis a step further back:—

"If then all life development—all organic forces—are due to mind action, we must postulate not only forces but guidance; not only such self-acting agencies as are involved in natural selection and