DR. WALLACE ON CREATIVE POWER.*

When Dr. Alfred Russel Wallace writes on the phenomena of Biology and its allied sciences, he writes with authority and is sure to be instructive; but when he travels beyond observed phenomena and endeavors to build up a system of deductive philosophy founded upon them, he seems to us to exhibit a singular capacity for failure. His latest work, "The World of Life," makes frequent reference to a former one, "Man's Place in the Universe," and shows that he adheres to the conclusions which six years ago aroused the hostility of many men of science. It is well, therefore, to recall the governing proposition to which his reasoning then led him. It was nothing less than this—that in the whole universe there is no body except this earth inhabited by living beings. To quote his own words:—

> "in like manner it may, and, I believe, will, turn out that, of all the myriad stars, the more we learn about them, the smaller and smaller will become the scanty residue which, with any probability, we can suppose to illuminate and vivify habitable earths. And when with this scanty probability we combine the still scantier probability that any such planet will possess simultaneously, and for a sufficiently long period, *all* the highly complex and delicately balanced conditions known to be essential for a full life-development, the conception that on this earth alone has such development been completed will not seem so wildly improbable a conjecture as it has hitherto been held to be."

Such is the conclusion of a book which ranks among the most gigantic edifices of special pleading ever constructed. We need not enter into the details, of scientific aspect, which conduct Dr. Wallace to his goal, such as the assumption that the universe consists of a plate of stars whose edge is the Milky Way, near (but not quite at) the centre of which the solar system is placed, in what is, therefore, held to be an exceptionally favorable position.

"Man's Place in the Universe" and its present successor, "The World of Life," may be compendiously described as forming the gospel of human importance—a result which Dr. Wallace faces with equanimity and complete consciousness of the opposition which the theory encounters from scientific thinkers. As a large portion of "The World of Life" goes beyond the historical account of the development of forms of life on the earth, it is well to state clearly Dr. Wallace's position. He holds that man was developed from brutes (p. 1); that on this earth the beginnings of life existed "myriads of years" before the forms of life with which we are acquainted had left their fragmentary remains on the rocks (p. 350); and that there exists "an infinite God," who, however, did not design the whole of the cosmos, but delegated his powers to "beings of a very high and to others of a very low grade of intellect," angels of various grades whose special occupations and duties he describes (pp. 393-395). From these main points will be seen the relation in which he stands to the current belief of Christendom.

The work now before us, "The World of Life," has two parts: the first, which occupies more than half of the book, treats of the knowledge of plants and animals which we derive both from a study of the world as it is and from an examination of fossil forms; and here we have an ample exposition of the way in which new species arise and are perpetuated. The whole process of the development of life, the transition from one form to another, is so slow that the average unscientifically trained critic of Darwinism is able to score an easy and apparent victory by challenging the Darwinian to show him a single instance of the development of one species from another. Two different standards have always been taken to measure our knowledge of the approximate time which has elapsed since this earth became habitable by vegetable or animal life. The physicists (like Lord Kelvin) base their calculations on the rate at which the earth loses, and has been losing, heat by radiation through its crust into space. Deductions on this basis are very various indeed. Sometimes it is asserted that since the period in which coal was formed about 400 millions of years must have now elapsed. Lord Kelvin places what is usually called the "age of the earth" somewhere in the neighborhood of 25 millions of years. On the other hand, biologists (like Huxley) demand a vastly greater period, owing to the extreme slowness of life-processes; and in this connection Dr. Wallace, in the book before us, maintains (p. 181) that the cooling of the earth does not take place by conduction from the heated interior through the solid crust, but by the escape of heated matter to the surface through hot springs, the flow of heated gases from volcanic areas, and outbursts of red-hot ashes and lava from volcanoes. If this is so, the period is lengthened very greatly, and the theory of Darwin correspondingly strengthened. But, independently of the cause indicated by Dr. Wallace, another source of error in the estimates of the physicists has arisen in the discovery of radium and its wonderful properties as a source of indefinitely prolonged heat. In any case, there is no doubt of the inconceivable slowness of the development of living forms; and biologists cannot, even if they would, "hurry up their phenomena" at the bidding of the physicists.

Dr. Wallace, however, in answer to the unreasonable challenge to show an instance in which development is taking place, cites a few cases in which Nature has been caught at work in the actual formation of new species. Among them is the development which has taken place, since the year 1419, on an uninhabited island near Madeira, of a new class of rabbit from some common rabbits which had been let loose there by Spanish voyagers. The new rabbit differs from the old in size, color, form of skull, and nocturnal habits. These changes result from changed environment, and their character is fully discussed by Dr. Wallace.

The reader will find a great deal of interesting information in this portion of the book. If we were asked in what part of the earth mosquitoes exist in greatest abundance, we should think of some swampy region of West Africa. But the guess would be wrong. We should never suppose that the region is within the Arctic circle, both in the eastern and in the western hemispheres. The dense clouds of these insects which are found in Siberia are described by the traveller, Seebohm; and it is very largely on them and their larvæ that the countless multitudes of birds migrating northwards from Europe and Central Asia subsist. The whole system of bird migration and the way in which the development of birds depends on insects are treated in ample detail by Dr. Wallace. His theory that the special markings on the wings, tail feathers, and heads of birds, and on the bodies of animals generally, is not convincing and is difficult to follow—especially in those most brilliantly colored of all creatures, the butterflies. In the last case the explanation

* "The World of Life: A Manifestation of Creative Power, Directive Mind, and Ultimate Purpose." By Alfred Russel Wallace, O.M., D.C.L., F.R.S. Chapman & Hall. 12s. 6d. net.

is somewhat involved, more especially as in various parts of the book he denies to insects a proper perception of what we call *color*.

One very important difficulty in the theory of development is well dealt with by Dr. Wallace—viz., the absence of several connecting links between various forms of animals, more especially in the period between the secondary and tertiary beds. There is here a gap between numerous groups of giant reptiles and the much higher and more varied mammals of what we may call recent times. His answer is simple and satisfactory. During this transition period "a large portion of our existing continents was dry land; the result being that the skeletons of very few of these unknown (missing) forms were fossilised; or, if there were any, they have been subsequently destroyed by denudation during the depression and elevation of the land which we know to have occurred."

We now come to what Dr. Wallace describes as one of the great mysteries of geology—the complete simultaneous extinction of many of the largest mammals all over the world in Pleistocene times. It has been sought to explain this by the huge sheet of ice which covered a large portion of the earth in the Glacial Epoch. But this is obviously insufficient; for, however successful this cause might be in the ice-covered areas, it could not account for the destruction which took place all over the earth. Dr. Wallace finds the solution in man's agency. The fact is that man's ancestry must be traced back to a period of co-existence with extinct species of vast antiquity; as Dr. Wallace says, "the common ancestor of man and the anthropoid apes *must* date back to the Miocene, if not to the Eocene, period"; and, as he further points out, spears of flint or even of tough wood were amply sufficient, as they are now in Java and elsewhere, to destroy the largest and most formidable animals.

It is impossible to give in the space at our disposal a reference to every branch of the subject of this book, and we must therefore pass on to the second, or deductive, portion of Dr. Wallace's work. With this we have less sympathy than with the first, or historical, section. He is an aggressive optimist. To him (p. 276)

> "this world of ours *is* the best of all *possible worlds calculated to bring about this result*. And if the best for its special purpose, then the whole course of life-development was the best; then also every step in that development and every outcome of it which we find in the living things which are our contemporaries are also the best."

Such optimism we find it difficult to separate from fatalism, and it leaves no clear room for moral choice. It is identical with the dogma "whatever is is right." Hence we are struck by its incongruity with the remainder of the above sentence:—

> "and if, in our blind ignorance or prejudice, we destroy them before we have earnestly endeavored to learn the lesson they are intended to teach us, we and our successors will be the losers—morally, intellectually, and perhaps even physically."

One great reason for the existence of water on the earth is, it appears, to produce endless variety of mountain, plain, and river scenery "for the delectation of all the higher faculties of man."

Dr. Wallace addresses himself finally to the question, "Is Nature cruel?" He decides that it is not. The lower animals, and especially those that multiply with great rapidity, were made, it appears, to be eaten—"and there was no reason whatever why that kind of death should have been painful to them. They could not avoid it, and were not intended to avoid it. It may even have been not only painless but slightly pleasurable—a sensation of warmth, a quiet loss of the little consciousness they had, and nothing more"; and so on. The suggestion may have been intended primarily to apply to the very early forms of life, but there is nothing in it which we may not apply to the rabbit, screaming in a steel trap or having his throat cut by a weasel. Finally, as regards his conception of an "infinite God" delegating his powers to various grades of angels (page 393), some of whom are charged with the duty of creating the universe of ether; "the next subordinate association of angels would so act upon the ether as to develop from it, in suitable masses and at suitable distances, the various elements of matter" which constitute the stellar universe—the whole notion strikes us as a *contradictio in terminis*, or even worse.