

Transcription, January 2015:

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### ‘Direction and Purpose in Nature.’<sup>1</sup>

*The World of Life*. By Alfred Russel Wallace. (Chapman and Hall. 12s. 6d. net.)

It is not without amazement that we welcome this new book by the veteran naturalist, who was Darwin’s collaborator. We do not wonder, indeed, that the *doyen* among evolutionists should summarize what he has been thinking and teaching for half a century, but we are delightedly amazed to find him so fresh and so eager for the fray. In fact the Nestor of the evolutionist camp passes quickly over tales of old battles, and advances eagerly to a new victory. We find him trouncing the old errors of materialism, scouting the new heresies of Mendelism and Mutationism, and what is even more remarkable, incorporating into his scientific system new views that seem to him to be sound—notably, for instance, Weismann’s subtle theory of Germinal Selection. The volume includes some interesting new applications and illustrations of the Darwinian theory of evolution—for instance, in regard to “recognition marks”—but its most prominent feature is “the popular yet critical examination of those underlying fundamental problems which Darwin purposely excluded from his works as being beyond the scope of his inquiry. Such are the nature and causes of Life itself; and more especially of its most fundamental and mysterious powers—growth and reproduction.”

While there is no unanimity of view as to what the principle of life may be, biologists are agreed in its descriptive definition as the relation between organisms and their environment. And as one of the fundamental facts in this relation is the distribution of living creatures upon the earth, we are not surprised that Wallace should begin with this subject, in which, since his early collecting days, he has not ceased to be interested. It is an unusual mode of approach, but full of significance. For example, there is the striking individuality of small areas, indicative of the stringency of selection and the delicacy of adaptation. “In the same field, even when apparently alike everywhere in the soil, in aspect, and in contour of surface, every plot of 16ft. square has its individuality.” Or, again, it is shown that “in fairly comparable areas the tropical species are often (and probably on the average) double those of the temperate zones. This seems to be the case among the higher animals, as well as among all the vascular plants.” And the author’s point is that the greater abundance of life is due not to the greater amount of heat alone, but rather to the much greater uniformity of climatic conditions during long periods. But while this geographical study illustrates dispersal, retrenchment, redistribution, and elimination, it does not give any clue as to the method by which new species arise to replace those that disappear. Therefore the author passes to an outline of some of the most important facts in regard to the “abundant and ever-present variability,” the hereditary relation and the enormous rapidity of increase. We say “some” of the important facts, for it seems to us that he brushes aside the modern theories of Mendelism and Mutationism too impatiently.

Dr. Alfred Russel Wallace returns to a vein which he has previously worked to great advantage—the delicacy of organic adaptation to particular niches in Nature. Thus there are many of our familiar British birds that are found to present constant differences from their Continental cousins, differences which “seem inexplicable on any other theory than that they are adaptations to the slight but undoubted

difference of climatal conditions which characterize our islands.” From cases like this he gradually works up, in a convincing fashion, to adaptation on the largest scales—for instance, to the co-adaptation of birds and insects through long ages, and the co-adaptation of both with the vegetation amid which they have developed. He links the multitude of mosquitoes on the Arctic tundras with the origin and continuance of the northward migration of birds, and makes a fine contribution to the characteristically Darwinian topic of the correlation of organisms. Incidentally he makes a sagacious criticism of the inference that young birds start alone and ahead of their seniors in the southward autumn migration.

We suspect that many readers who do not care for philosophy will find the chapter on “recognition marks” the most interesting in the whole book. Of many mammals and birds it may be said that they are inconspicuous when they keep still and conspicuous when on the move. The rabbit’s upturned tail and the wheatear’s white rump are familiar to all, and most naturalists will admit their value as recognition marks. The faces and even the horns of antelopes are often extremely “ken-speckle,” and may often be of survival value. Moreover, while the recognition marks are often of value now in guiding young to their parents, mate to mate, and kin to kin, they may also have had significance when species were still incipient, when they served as signs which brought similar forms together and repelled dissimilars, thus helping towards isolation, thus towards prepotency, and thus towards the fixing of specific characters. Dr. Wallace withdraws his previous suggestion that the theory of recognition marks is applicable to Lepidoptera and the like, for here it is by scent that recognition is primarily effected, and vision is at most of secondary significance. “Here again we find another, and, I think, a very conclusive argument against female choice having had any part in the production of beautiful and varied colours in the males of butterflies, or probably of any insects, since it is clear that the attraction is through another sense than that of sight; and that all that vision can do in this direction is to enable the insect to recognize, perhaps at a greater distance, the individuals which are thus attractive.” It may be, however, that fragrance and brilliancy are correlated.

Evolution implies an age-long interaction between two variables—organisms and their environments. One of these, the environment, is in great part an independent variable, for the earth develops, on the whole, insouciant of all its tenants. Mr. Wallace makes much of the apparent inorganic preparation which suits living creatures very well; but it is difficult to exclude the view that if the terrestrial conditions had been different there would simply have been, within the limits of viability, a different series of organic adaptations. The author exalts “the earth’s surface-changes as the condition and motive power of organic evolution,” and here seems to us to concede too much. It is true that the environment stimulates organisms to activity, to change, to exertion; that it punctuates life, and prunes the tree. But is there not a danger of exaggerating what we may call the dependence of the creature in variability and in other forms of initiative? It is true that the dynamic relation between organisms and their respective environments always tends towards an equilibrium, but we are not prepared to admit that “once such an equilibrium is attained, there seems no reason why it should not be permanent.” There is just one reason, which is the secret of life, that the organism is creative, insurgent, autonomous. It selects its environment, modifies it, and sometimes conquers it. Of course, the environment punctuates life, and may at any moment put in a full-stop, but murder is not subjugation. We can picture a snow-covered ice-bound British environment, in which the equilibrium established was represented by the elimination of all living creatures except a few snow-plants, rotifers, and the like—such a flora and fauna as the Antarctic explorers tell us of—but our belief is that till the worst comes to the worst life has always another card to play, and that in spite of appearances every Polar organism shouts *Vita victrix*.

Of great interest is the chapter dealing with the three most formidable difficulties which Darwinism has to face to-day. The first is that the slight beginnings of new organisms would be useless, and could not therefore be preserved and increased by natural selection—to which it is answered that the usual method of evolution is to make apparent novelties by the transformation or specialization of old-established structures. The second difficulty is that new adaptations imply a number of concurrent variations often in different parts of the body—to which it is answered that time is long and variability great, and that coincident variations are demonstrably numerous in connexion with both difficulties. Professors Baldwin, Lloyd Morgan, and Osborn have suggested that adaptive individual modifiability may serve as a life-saving screen till hereditary germinal variations in the same direction have grown strong. The third difficulty is in the excessive development of characters, such as decorations and weapons, beyond the limits of utility, and the answer is found in Weismann's ingenious hypothesis of germinal selection.

In the last third of his book Dr. Alfred Russel Wallace raises those difficult questions of origin, of efficient cause, of direction, or significance which are perennially interesting to the inquiring human spirit. In the course of a long life of investigation the author has come to certain conclusions, and whether they commend themselves to us or not, we must remember that they are the deliberate conclusions of one who is as whole-heartedly devoted to modern science as any of his critics, as fully imbued with the teachings of evolution as they can be, who still upholds, as he has always done, the essential teachings of Darwinism. The conclusions are that growth, development, adaptation, and the progressive evolution which culminates in Man cannot possibly be interpreted in terms of mechanical categories. Here the author is at one with many cautious vitalists who have found no mechanistic interpretation of life that will work. But Dr. Wallace does not remain in this negative position. He is convinced of the absolute necessity for an organizing and directive life-principle. This corresponds, we may say, to the Entelechy, on whose demonstration Dr. Hans Driesch has bestowed so much patience and ingenuity. But Dr. Wallace goes further, postulating the directive action of organizing spirits—"ministering angels through many descending grades of intelligence and power." He seems to us on firmer ground when he raises the final question of the significance of the evolution-drama, and finds the answer in Man—that child of Nature in whom the rationality implicit throughout became at length articulate.

Before we leave this volume, which is so delightfully characteristic of one who has in no ordinary degree the veneration and esteem of living naturalists, we venture to make a note on a matter to which he repeatedly refers with an apparent soreness, and that is the boundary of the scientific "universe of discourse." This is a matter for definition and convention, and when one calls the hypothesis of a pervading purpose in Nature "unscientific," one does not mean anything worse than that it is philosophical. It is a formulation on a different plane from that to which modern science is more and more restricting itself. It is the work of science to analyse, to reduce things to a common denominator, to refund phenomena into their antecedent conditions, to give genetic descriptions, to find general formulæ which sum up and unify a whole series of occurrences, and so on. But this does not satisfy the human spirit; it is description, not explanation. The common denominator remains mysterious, and science never tells how or why so much should come out of so apparently little. At most it gives an account of the tactics of Nature; it never explains the strategy. For this reason every intellectual combatant has some philosophical construction, which is always in part based on his own experience. But this ideal construction, which each must make after his own fashion, is not a scientific construction, and it cannot submit to "the touchstone of validity for all normally constituted minds." Thus it is that many who are at one with Dr. Alfred Russel

Wallace in a general belief in the spirituality of Nature will be unable to accept his particular representation of this. At these heights we must agree to differ.

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*The Alfred Russel Wallace Page*, Charles H. Smith, 2015.