

Transcription, February 2021:

The Field, No. 1904 (22 June 1889): 914c. (anon).

[p. 914]

‘Darwinism.’

It has been said that the revolution effected by Charles Darwin in the way of looking at organic nature is only comparable to that effected by Copernicus, when he transferred the centre of our system from the earth to the sun. Both prepared the way for looking at the universe of things as a unity, subject everywhere to the same laws, and how great a gain this was for the human intellect we have not yet perhaps adequately realised. But the victory of Darwin has been more rapid than was that of Copernicus. The old doctrine of the invariable fixity of species, and the origin of each in an act of special creation, may be said to have become absolutely extinct; and the evolution of all organic forms by natural descent through the many successive stages of the earth’s history, is accepted now, it may be said, by every philosophic naturalist. It is true that the complete adequacy of the Darwinian hypothesis has been called in question by many eminent men, and it is partly with reference to these that Dr Wallace has written his present exposition. His share in the original conception of the theory and his wide knowledge mark him out as pre-eminently fit to undertake such a review of the subject as he has here furnished.

It has been commonly objected against the theory of natural selection that the infinitesimal variations which take place in organised beings afford a very poor foundation for the huge superstructures which have been built upon them. But Dr Wallace takes great pains to show that such variations are by no means infinitesimal. In a number of diagrams he exhibits the large amount of variation that normally occurs. Even Mr Darwin himself, he states, was not aware of the extent to which such variation normally takes place, as, for instance, when he remarked: “A variety when once formed must again, *perhaps after a long interval of time*, vary or present individual differences of the same favourable nature as before;” and again, “Unless such occur natural selection can do nothing.” There is no fear, Dr Wallace contends, that natural selection will be left idle; the amount of variation constantly going on, in all directions, will provide it with never-ceasing employment. Natural selection is not simply a force directed to the formation of new species; it is a conservative process, the primary effect of which will be “to keep each species in the most perfect health and vigour, with every part of its organisation in full harmony with the conditions of its existence.” It is when conditions change, and the struggle for existence becomes most severe—when, so to speak, a species has to keep pace with the times in order to sustain itself—that natural selection comes in as an innovative power by preserving the most efficient in the battle of life. Of course, as Darwin truly said, if the favourable variations are not presented, it cannot act; and not the least important service rendered by Dr Wallace’s book consists in his insisting so strongly on the immense amount of material which the process has at its command.

Having in the first five chapters of his book passed in review the main facts on which the theory is founded, the author proceeds to apply these in detail. It has been urged as an objection to the theory that many peculiarities of organic structure seem in no way to contribute to the well-being of the plant or animal; but Mr Wallace remarks: “From the light gained during even the last few years, I am convinced that very many structures which now appear to us useless will hereafter be proved to be useful, and will therefore come within the range of natural selection.” A difficulty, too, has been felt in accounting for the first beginnings of important organs; but it must not be forgotten that these “date back to a very remote past, when the world and its inhabitants were both very different from what they are now.” We can only trace the beginnings of species from others very nearly allied to them, and “to ask of a new theory that it shall reveal to us exactly what took place in remote geological epochs, and how it took place, is unreasonable.” It does not appear requisite that we should imagine useful organs to have been developed from structures absolutely useless, but rather that in the long descent what was useful, becoming necessarily more and more complex in its adaptation to its purpose. The way in which this complexity is arrived at is shown by the eye, which in its simplest

form is merely a collection of pigment cells covered with a translucent skin; and there are many other instances in which a reasonable guess may be hazarded as to the way the present state of things has been brought about.

We cannot follow Dr Wallace page by page in his discussion of difficulties and objections, and the problems of hybridism. More interesting to the reader will be the chapters on colour and mimicry. Naturally, if colour be something acquired for the advantage of the plant or animal, mimicry in various degrees will follow. Of this many wonderful examples are given; and in the last number of *The Field* we ourselves gave a conspicuous instance in our illustration of the leaf insect. That colour is not owing to the immediate influence of light on the organism, Dr Wallace considers proved; its marvellous diversity, he says, can only be accounted for by the adaptation to the ever-shifting variations of circumstance, perpetuated by the weeding-out operation of natural selection. To Mr Darwin's secondary hypothesis of sexual selection, Dr Wallace is a strenuous opponent. He thinks it is not shown that the females select the males: "Female birds may be charmed or excited by the fine display of plumage by the males; but there is no proof whatever that slight differences in the display have any effect in determining their choice of a partner." On the other hand, the warfare between males for the possession of the females is incessant, not only among the higher animals, but even so low down as the insects; so that what sexual selection exists is rather exercised on the male side. Dr Wallace is inclined to see in crests, accessory plumes, and the like, an evidence of superabundant vitality, which is able freely to develop itself, because co-existent with an otherwise perfect adaptation to the conditions of existence. There are certain considerations advanced here which seem rather to minimise the action of selection in the production of ornament.

Cross-fertilisation and the inter-dependence of flowers and insects occupy, of course, a considerable space; but to this somewhat familiar matter we need not further refer. The "Geographical Distribution of Organisms" is the subject of a chapter, and is illustrated by a map of the world on Mercator's projection, showing the thousand-fathom line round the continents. The land area of the globe is the water areas .28 to .72. The mean height of the land above sea level is 2250ft. The mean depth of the ocean is 16,640ft. The bulk of the land above sea level is 23,450,000 cubic miles; the bulk of the ocean waters is 323,800,000 cubic miles. This proportion renders it probable that the main distribution of the land above the water has remained pretty constant during the past ages of zoologic time—at least during the secondary and tertiary periods. With one or two exceptions, the line of thousand-fathom depth will include all those islands which are called continental, in contradistinction to the oceanic islands which have arisen in the sea itself. A glance at the map shows how, within the thousand-fathom limit, there are as it were a number of bridges, across which the migration of species would have been possible; and thus it is easy to account for allied species existing in parts of the world far removed from each other, without any violent hypotheses, or breaks in the orderly continuity of life. This chapter and that on the "Geological Evidences of Evolution" give an admirable summary of the facts which go to prove this continuity.

* Wallace. —An Exposition of the Theory of Natural Selection, with some of its Applications. By Alfred Russel Wallace, LL.D., F.L.S., &c. With Map and Illustrations. London: Macmillan and Co.

The Alfred Russel Wallace Page, Charles H. Smith, 2021.