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‘Notices of New Books.’

*Island Life; or, the Phenomena and Causes of Insular Faunas and Floras, including a revision and attempted solution of the problem of Geological Climates.* By Alfred Russel Wallace, Author of ‘The Malay Archipelago,’ &c. Demy 8vo, pp. 512, with twenty-six Maps and Illustrations. London: Macmillan & Co. 1880.

There must be few, if any, of our readers who have not derived both pleasure and profit from a study of Mr. Wallace’s ‘Geographical Distribution of Animals,’ published in 1876. The present volume, which may be considered as a popular supplement to, and completion of, that work, will afford no less gratification and instruction. It deals with highly important and interesting problems, and embodies a mass of facts collected and arranged with admirable skill and precision. Although at first sight somewhat fragmentary and disconnected, it is really the development of a clear and definite theory, and its application to the solution of a number of biological problems. That theory is, briefly, that the distribution of the various species and groups of living things over the earth’s surface, and their aggregation in definite assemblages in certain areas, is the direct result and outcome of a complex set of causes which may be grouped as “biological” and “physical.”

The biological causes, to use the author’s own words, are mainly of two kinds—*first*, the constant tendency of all organisms to increase in numbers and to occupy a wider area, and their various powers of dispersion and migration through which, when unchecked, they are enabled to spread widely over the globe; and, *secondly*, those laws of evolution and extinction which determine the manner in which groups of organisms arise and grow, reach their maximum, and then dwindle away, often breaking up into separate portions which long survive in very remote regions.

The physical causes are also mainly of two kinds. We have, *first*, the geographical changes which at one time isolate a whole fauna and flora, at another lead to their dispersal and intermixture with adjacent faunas and floras; and, *secondly*,

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climatal changes, the causes of which Mr. Wallace investigates at some length, with the aid of geologists, physicists and explorers.

In the first half of his work (pp. 1-229), Mr. Wallace deals with “The Dispersal of Organisms,” its phenomena, laws, and causes. Beginning with simple and familiar facts relating to British and European quadrupeds, he defines the character of “areas of distribution” (Chap. II.) as applied to species, genera, and families, and illustrates the subject by maps showing the peculiarities of distribution of some well-known groups of birds. Taking our British mammals and land-birds, he follows them over the area they have been found to inhabit, and, classifying the facts of distribution (Chap. III.), obtains a foundation for the establishment of “zoological regions,” which are clearly characterized as distinct from the usual geographical divisions of the globe.

The facts thus far established are then shown (Chap. IV.) to be necessary results of the “law of evolution.” The nature and amount of “variation” is exhibited by a number of curious examples; the origin, growth, and decay of species and genera are traced, and all the interesting phenomena of isolated groups and discontinuous generic and specific areas are shown to follow as logical consequences.

Mr. Wallace next investigates (Chap. V.) the means by which animals are enabled to overcome the natural barriers which often seem to confine them to very restricted areas, the extent to which

these barriers are liable to be altered or removed, and the nature of the changes of sea and land which have taken place in past times. The last-mentioned portion of the enquiry is shown to be the most important, as it is the most fundamental, and is discussed at some length, evidence being adduced to prove that the main features of our globe—the position of the great ocean and the chief land-areas—have remained, on the whole, unchanged throughout geological time. The general stability of continents, however, has been accompanied by constant changes of form, and insular conditions have prevailed over every part in succession, and the effect of such changes on the distribution of organisms is pointed out.

In the succeeding three chapters (VI., VII. and VIII.) Mr. Wallace investigates very fully the question of geological climates

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and their causes, considering that changes of climate have doubtless been agents of the first importance in modifying specific forms as well as affecting the distribution of animals. Step by step the foundation is laid for a scientific interpretation of the phenomena of distribution, until the reader reaches the second part of the work (pp. 233-512), which embodies the results of an investigation of a series of typical Insular Faunas and Floras, with a view to explain the interesting phenomena they present.

Amongst other conclusions arrived at, Mr. Wallace argues, from the evidence which he adduces, that “mere distance is one of the least important of the causes which have determined the likeness or unlikeness in the animals of different countries;” “that such differences and resemblances cannot be due to existing conditions, but must depend upon laws and causes to which mere proximity of position offers no clue;” and “that if we compare corresponding portions of different continents we find no indication that the almost perfect similarity of climate and general conditions has any tendency to produce similarity in the animal world.”

In conclusion, Mr. Wallace expresses his conviction of the complete interdependence of organic and inorganic nature. “Not only,” he says, “does the marvellous structure of each organised being involve the whole past history of the earth, but such apparently unimportant facts as the presence of certain types of plants or animals in one island rather than in another are now shown to be dependent on the long series of past geological changes,—on those marvellous astronomical revolutions which cause a periodic variation of terrestrial climates,—on the apparently fortuitous action of storms and currents in the conveyance of germs,—and on the endlessly varied actions and reactions of organised beings on each other.”

We close this volume with a sense of deep obligation to Mr. Wallace. Following his guidance, we have felt as one led by some “good fairy” to the top of a high mountain; we have looked down into the valleys beneath, and beyond across the great expanse of ocean with its many islands; we have seen passes, peaks, and glaciers while listening to the story of their origin; we have noted a marvellous variety of vegetation, and have become acquainted with many strange and curious animals,

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while marking the countries which they inhabit and the limits which appear set to their geographical distribution. We have felt the changes of climate as we travelled; and having followed the explanation of all we have witnessed, so attractively and withal so logically offered by our guide, we leave him with a feeling of regret that our voyage of discovery has ended.