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*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.—Harper Brothers, New York, 1881.

The authors of the theory of evolution undoubtedly feel the responsibility involved in revolutionizing one of the most important branches of Science; it is therefore natural to find both Dr. Darwin and Mr. Wallace devoting their best energies to aid evolutionists in placing “the theory” upon a sound basis.

Perhaps one of the strongest arguments that can be advanced in favor of evolution is the fact, that it offers a key for solving difficulties encountered by naturalists, which hitherto were inexplicable, or accounted for by a line of reasoning now shown to be erroneous.

The distribution of animal life upon the globe, which forms the subject of the present work, exhibits in a strong light some of the fallacies of the older naturalists, and the value of the theory of evolution in interpreting the work of Nature.

The old school of naturalists explained the geographical distribution of animals by believing, that “the several species of animals and plants” were special creations, and consequently assumed, that every animal was *exactly* adapted to the climate and surroundings amid which it lived, and that the only, or, at all events, the chief reason why it did not inhabit any other country was that the climate or general condition of that country was not suitable to it.

In the present state of knowledge respecting the fauna and flora of the whole world, it is not difficult to prove that other reasons must be found to account for the phenomena met with in the general distribution of animal life, and Mr. Wallace makes the case quite clear by giving some striking illustrations.

It is true that hot climates differ from cold ones in all their organic forms, but its effects are by no means constant, but are irregular and uncertain, and the contrast does not bear any proportion to the difference of temperature.

For instance, between frigid Canada and sub-tropical Florida there are less marked differences in the animal productions than between Florida and Cuba or Yucatan, which are much more alike in climate and so much nearer together. So the differences between the birds and quadrupeds or temperate Tasmania and tropical North Australia are slight and unimportant as compared with the enormous differences we find when we pass from the latter country to equally tropical Java, and if we compare corresponding portions of different continents, we find no indications that the almost perfect similarity and general conditions have any tendency to produce similarity in the animal world. The equatorial parts of Brazil and of the west coast of Africa are almost identical in climate and in luxuriance of vegetation, but their animal life is totally diverse. In the former we have tapirs, sloths, and prehensile-tailed monkeys; in the latter, elephants, antelopes, and man-like apes; while among birds, the toucans, chatterers and humming-birds of Brazil, are replaced by the plantation-eaters, bee-eaters and sun birds of Africa. Parts of South-temperate America, South Africa and South Australia correspond closely in climate; yet the birds and quadrupeds of

these three districts are as completely unlike each other as those of any parts of the world that can be named. The present work, although complete in itself, is one of a series prepared by Mr. Wallace to account for the geographical distribution of animal life, by the theory of evolution, and being the result of many years study by one of the most eminent of living naturalists, will command the attention of all who desire to find a true solution of the subject.

Some of the most remarkable and interesting facts in the distributions and affinities of organic forms are presented by *islands* in relation to each other and to the surrounding continents. Yet their full importance in connection with the history of the earth and its inhabitants has hardly yet been recognized; and in order to direct the attention of naturalists to this most promising field of research, Mr. Wallace has restricted himself in the volume now before us, to the elucidations of some of the problems there presented to us.

Such then is the scope and purpose of “Island Life, or the Phenomena and Causes of Insular Faunas and Floras,” involving the study of a class of subjects embracing in their very nature the visible outcome and residual product of the whole past history of the earth. There is no royal road to the acquisition of knowledge, and to prepare those readers who have not been trained in such studies to appreciate the conclusions drawn, Mr. Wallace in the first eight chapters devotes much space to the explanation of the mode of distribution, variation, modification and dispersal of species and groups, illustrated by facts and examples; of the true nature of geological change as affecting continents and islands; of changes of climates, their nature, causes and effects; of the duration of geological time and the rate of organic development.

The aim of Mr. Wallace in this work is the development of a clear and definite theory, and its application to the solution of a number of biological problems. That theory may be briefly stated as follows: 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, are the direct result and outcome of a complex set of causes, which may be grouped as “*biological*” and “*physical*.” The *biological* causes 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 mainly of two kinds. We have, first, the geographical changes which at one time isolate a whole fauna and flora, at another time lead to their dispersal and intermixture with adjacent faunas and floras, and here Mr. Wallace endeavored to ascertain and define the exact nature and extent of these changes, and to determine the question of the general stability or instability of continents and oceans; in the second place he also investigated the exact nature, extent and frequency of the changes of climate which have occurred in various parts of the earth, because, as it may be supposed, such changes are among the most powerful agents in causing the dispersal and extinction of plants and animals. The importance attached to the geological climates and their causes, induced Mr. Wallace to discuss this branch of the subject at some length, and the most recent investigations of geologists, physicists and explorers were fully called into requisition.

Mr. Wallace next applied these facts and theories to explain the phenomena presented by the floras and faunas of the chief islands of the globe, which are classified, in accordance with their physical origin, in three groups or classes, each of which is shown to exhibit certain well marked biological features.

Mr. Wallace then defines what are called “*areas of distribution*,” as applied to species, genera and families, and, taking British mammals and land birds, he follows them over the whole area they inhabit, and obtains a foundation for the establishment of “*zoological regions*,” and a clear insight is formed of their character as

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distinct from the usual geographical divisions of the globe.

All these facts are then shown by Mr. Wallace to be a necessary result of the “*law of evolution*.” The nature and amount of “*variation*” are 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.

The remaining subjects discussed by Mr. Wallace carry him into the realm of fierce controversies, and relate to theories involving problems awaiting further investigations for their solution. One of these subjects—The Position of the Great Oceans and Chief Land Areas—is dealt decisively by Mr. Wallace, who claims that “on the whole they have remained unchanged throughout geological time.” This declaration of the author has been already challenged, and we shall watch with interest if Mr. Wallace is capable of maintaining his position on this subject.

Perhaps the most valuable part of this work is the discussion of the question of geological time as bearing on the development of the organic world, leading to an investigation as to the exact nature of past changes of climate.

In answer to those who may consider the subject last spoken of as unsuited to such a work as the present, the author claims that, although many of the causes introduced are far too complex in their combined action to enable us to follow them out in the case of any one species, yet their broad results are clearly recognizable, and we are thus enabled to study more completely every detail and every anomaly in the distribution of living things, in the firm conviction that by doing so we shall obtain a fuller and clearer insight into the causes of nature, and with increased confidence that the “mighty maze” of Being we see everywhere around us is “not without a plan.”

No person should offer an opinion on the “theory of evolution” who has not studied this work of Mr. Wallace, for it forms an essential part of the literature of the subject.

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