

Transcription, June 2017:

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[p. 3a]

The comparatively new department of science which has been termed geographical zoology, owes its chief development, if not its creation, to Mr A. R. Wallace. That keen-sighted observer and charming writer has devoted his attention of late years almost exclusively to the phenomena of the dispersal of plants and animals, and his latest book, *Island Life* (2), is at once a popular exposition of the facts and theories of his more elaborate work, the “Geographical Distribution of Animals,” and a supplement to it, containing “the result of four years’ additional research and work” in the same interesting field. The flora and fauna of islands, and their relation to the plant and animal life of the neighbouring continents, present some of the most intricate and interesting problems in this branch of science. They also supply some of the most weighty arguments in support of the theory of evolution and “natural selection,” which are rapidly becoming accepted doctrines by scientific men; and they afford, within a comparatively small compass, the means of illustrating the whole process by which species has been differentiated, preserved, or extinguished. Mr Wallace’s book is divided into two parts, the first of which is devoted to a development of a clear and definite scheme of the phenomena, laws, and causes of the dispersal of organisms, of which the key is evolution; while the second applies that theory to the solution of a variety of biological problems, presented more especially by insular flora and fauna. As the most important of the doctrines which he desires to establish and define, he enumerates the former wide extension of all the groups now discontinuous; the general permanence throughout geological time of the present land masses and oceans; and the frequency of great climatic changes in past periods of the earth’s history. Holding the second of these doctrines proved by the whole weight of the geological evidence on the subject, he is, of course, precluded from bringing in the aid of “hypothetical continents, bridging over the deep oceans,” by which it has been attempted to explain the anomalies of geographical distribution. Changes of climate and surroundings, therefore, are relied upon as explaining all the main phenomena of distribution, and generic and specific affinities. This compels him to enter into a minute examination of the evidence—more particularly the geological and astronomical evidence—of the various climatic and physical conditions through which the earth has passed. He accepts, with large modifications, Dr Croll’s theory of periodic glacial epochs, determined by the periods of maximum excentricity of the earth’s orbit and the recurrence of winter in aphelion in the northern hemisphere. But while admitting these to be factors in producing great revolutions of climate, he attributes a far more powerful influence to the changes in the extent, elevation, and configuration of northern lands, which, by allowing a larger or smaller volume of heated water from the tropics to flow into the Arctic areas, has sometimes intensified and sometimes counteracted the astronomical causes at work. This leads to an inquiry into the epoch of the appearance of organised life on the planet; and here a formidable difficulty is met with upon the threshold; for while geologists have calculated at about 200 millions of years the whole duration of geological time, as indicated by the series of stratified formations, and Mr Darwin’s theory requires a period longer than that which has elapsed since the deposition of the lower Cambrian strata for the earliest appearance of life upon the earth, astronomers and physicists will not allow a much longer period than a hundred millions of years for the solidification of the earth’s crust. Mr Wallace, however, by an examination of the phenomena of denudation and deposition as at present going on, comes to the conclusion that the estimate of geologists has been excessive, and that twenty-eight million years is an approximation to the period since the Cambrian, thus leaving sufficient time for the evolution of the forms of life found in these strata.

Mr Wallace's theories and deductions will be combated, but no one can deny the incisive clearness and force with which he has stated them, nor the significance of the evidence which he adduces in their support. One important factor in his calculations of climatic change and its influences he seems to take too much for granted. He assumes, as he is entitled to do from all that is known of [p. 3b] the region, that the area within the Antarctic circle consists chiefly of a huge mass of high glacier covered land, but it is scarcely a permissible assumption that this physical condition of the Antarctic lands existed during all previous geological periods. The second part of Mr Wallace's book is of even greater interest than the first; it is an application of his theories of geographical distribution to the various groups into which he divides the islands of the earth—Oceanic islands, ancient and recent continental islands, and “anomalous islands,” the last class including Celebes and New Zealand. A comparison of the existing flora and fauna of the islands and island groups which he selects, and their relation to the adjoining continents, the facilities for their dispersal and reception, and their history, as evidenced by their geological formation and the depth of the surrounding ocean bed, brings out a chain of evidence of such surpassing strength and completeness that it seems impossible to escape from the conclusion that it is to evolution, with the climatic and physical changes which the earth's surface has undergone, that we have to look for the explanation of the phenomena of distribution of plant and animal life.

(2) *Island Life, or the Phenomena and Causes of Insular Flora and Fauna, including a Revision and Attempted Solution of the Problem of Geological Climates.* By A. R. Wallace. London: Macmillan & Co.

*The Alfred Russel Wallace Page, Charles H. Smith, 2017.*