

² *The Geographical Distribution of Animals.*
With a Study of the Relations of Living and Ex-

—The subject of the geographical distribution of animals² was one with which tinct Faunas as elucidating the Past Changes of the Earth's Surface. By ALFRED RUSSELL WALLACE New York: Harper and Brothers. 1876. Two vols 8vo, pp. xxiii., 503; ix., 607

naturalists formerly concerned themselves but little. Taking it for granted that animals were especially adapted to live in certain localities, or were created with especial reference to their fitness for the localities in which they are found, it was not surmised that there could be any reason for the existence of a given species in a given place further than its fitness for the physical conditions of the place; and as this fitness was assumed once for all, there was an end of all scientific investigation of the matter. It was supposed that, in general, certain groups of animals were made to live within the tropics, others in the temperate and others in the frigid zones, but that the groups living within the tropics or in the temperate zones were similar all around the world. If it had been pointed out that the living edentata of South America or the living marsupials of Australia strikingly resemble the extinct edentata and marsupials of these two continents, the fact would have been taken only to imply that, after one group of animals had been annihilated, another similar group had been created in the same region, because in the eternal constitution of things South America is fitted to be the home of edentata and Australia to be the home of marsupials.

This kind of classification by zones had all the crudeness of the old classification of languages as classical, modern, and Oriental; and as long as such a single theory of adaptation was entertained as final, there was not likely to be much intelligent or fruitful scrutiny of the habitats of animals. But facts brought to light during the past forty years have quite upset these crude and simple theories, and have shown that the distribution of animals is an exceedingly complex phenomenon, and of the greatest interest, moreover, for the light which it throws on the past history of life on the globe. For example, the native animals of Australia and New Zealand are beginning very rapidly to retreat and disappear before the corresponding animals which Europeans have carried to those countries; and this shows that there is no especial or peculiar relation of fitness between the animals and their habitat. Again, while deer range all over America, Europe, and Asia, through the greatest diversities of climatic conditions, there are none in Africa south of the desert; and the case is similar with bears and pigs. So, on the other hand, though the physical conditions of life are very similar in Australia, South Africa, and

the Argentine Republic, there is no similarity whatever between the faunas of these regions. In the seas separated by the Isthmus of Darien, the conditions of life are almost identical, yet the marine faunas are entirely distinct. And in general the range of any group of animals is found to be limited strictly and constantly by natural barriers, such as high mountain-chains or impassable seas, but only vaguely and irregularly by alterations in climate or soil. In view of such facts, the geological succession of similar organisms in the same locality is now held to imply that the later organisms are the slightly modified descendants of the earlier ones, both the earlier and the later having been kept within their habitat by the same persistent natural barriers. The present and past distribution of animals becomes thus a curious and interesting illustration of the Darwinian theory, and at the same time throws considerable light on the history of the geographical changes which have taken place on the earth's surface. To the naturalists of our own time the native country of a group of animals is a matter of as much importance as its structure and habits; and the study of distribution has become as much a recognized part of biology as the study of embryology or classification.

Those who studied carefully the able and fascinating work of Mr. Wallace on the Malay Archipelago cannot have failed to recognize with what a masterly hand the problems of distribution were there treated. There is no other field of natural history which the illustrious author has made so thoroughly his own. In the two volumes before us he exhibits an erudition fairly comparable with that which characterized Mr. Darwin's remarkable treatise on domesticated animals; and he has given us a work which quite throws into the shade everything else that has been published on the subject. The four grand divisions of the work treat of the means of dispersal of animals and the geographical condition which affect distribution; of the distribution of extinct animals; of the zoological regions of the earth's surface; and of the geographical relations of the chief families of land animals. For students of biology such a book needs no other recommendation than is given by the name of its author: all such students will welcome it as an invaluable and much-needed manual for daily reference. But to the general reader also it is of great interest, for it is a most powerful contribution to the defense of the famous

theory which Mr. Wallace thought out simultaneously with Mr. Darwin, and it is written in that simple and winning style which makes all Mr. Wallace's books so pleasant to read.