

II.—BY DR. THEODORE GILL.

One of the most important works of the year is a treatise, in two volumes, "On the Geographical Distribution of Animals, with a Study of the Relations of Living and Extinct Faunas, as elucidating the past Changes of the Earth's Surface," by Alfred Russell Wallace, author of the "Malay Archipelago," and a co-discoverer with Darwin of the law of Natural Selection. This author has long been favorably known as a geographical zoologist, and first defined the boundaries between the Australian and Indian realms.

He divides his subject into several parts. In the first part he discusses the principles and general phenomena of the distribution under chapters, (1) introductory; (2) the means of dispersal and the migrations of animals; (3) distribution as affected by the conditions and changes of the earth's surface; (4) on zoological regions; and (5) classification as affecting the study of geographical distribution. In the second part he discourses on the distribution of extinct animals; and in the third part he enters into a consideration of "zoological geography: a review of the chief forms of life in the several regions and sub-regions, with the indications they afford of geographical mutations." In a fourth and final part he considers the geographical zoology in a systematic sketch under the different families of animals in their geographical relations.

The older naturalists, says Mr. Wallace, "had a sort of vague notion that certain forms were peculiar to hot climates, and that certain others were only found in cold countries; but that was about all they knew or cared to know. Of the necessity of precise knowledge on the subject of locality they were absolutely incredulous. To the modern naturalist, on the other hand, the native country, or 'habitat,' as it is technically termed, of an animal or a group of animals is a matter of the first importance, and, as regards the general history of life upon the globe, may be considered to be one of its es-

sential characters. The structure, affinities, and habits of a species now form only part of its natural history. We require, also, to know its exact range at the present day and in prehistoric times, and to have some knowledge of its geological age, the place of its earliest appearance on the globe, and of the various extinct forms most nearly allied to it. To those who accept the theory of development as worked out by Mr. Darwin, and the views as to the general permanence and immense antiquity of the great continents and oceans so ably developed by Sir Charles Lyell, it ceases to be a matter of surprise that the tropics of Africa, Asia, and America should differ in their productions; but rather that they should have any thing in common. Their similarity, not their diversity, is the fact that most frequently puzzles us."

The author has confined his investigations to the several classes of vertebrates, a few prominent families of insects, and the branch of mollusks. An analysis of his work, however, reveals that he was chiefly influenced by the phenomena of the distribution of birds, with which class he was evidently most familiar; with the other classes he was apparently but imperfectly conversant. In one paragraph (vol. i., p. 56) he discusses the question of "which class of animals is of most importance in determining zoological regions." He arrives at the conclusion that in all essential points "the mammalia are pre-eminent; and they possess the additional advantage of being the most highly developed class of organized beings, and that to which we ourselves belong." Many naturalists, however, will be disposed to dissent from him in this view; and, taking the author's own standard of what best qualifies a group for the expression of laws of geographical distribution, we are constrained to believe that the inhabitants of fresh-water basins, and especially the fishes, are pre-eminently the most truth-telling exponents of the relations of the several regions of the globe to each other now and in the past. It is evident, however, that, in spite of the expression of opinion of the author, he has been influenced by the facts of geographical distribution of mammals much less than by those of birds; and to this bias is undoubtedly attributable the sequence and combinations of the "regions" which he has adopted. These regions are six in number, and for them he adopts the names of his compatriot, Mr. Sclater. The regions are divided by a procrustean system each into exactly four sub-regions. They are as follows:

I. The Palearctic Region, with the sub-regions (1) North America, (2) Mediterranean (or S. Eu.), (3) Siberia, and (4) Manchuria (or Japan).

II. The Ethiopian Region, with the sub-regions (1) East Africa, (2) West Africa, (3) South Africa, and (4) Madagascar.

III. The Oriental Region, comprising the sub-regions of (1) Hindostan (or Central Ind.), (2) Ceylon, (3) Indo-China (or Himalayas), and (4) Indo-Malaya.

IV. The Australian Region, embracing the sub-regions of (1) Austro-Malaya, (2) Australia, (3) Polynesia, and (4) New Zealand.

V. The Neotropical Region, including the sub-regions of (1) Chili (or S. Temp. Am.), (2) Brazil, (3) Mexico (or Trop. N. Am.), and (4) Antilles.

VI. The Nearctic Region, with the sub-regions (1) California, (2) Rocky Mountains, (3) Alleghanies (or Eastern U. S.), and (4) Canada.

This is not the place to further comment upon Mr. Wallace's views. Suffice it to say that, although there are many errors, the work is one of sterling value; and will doubtless give a decided impetus to the philosophical consideration of the phenomena of the distribution of animal life over the earth, and its causes.