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*ESSAYS BY DR. WALLACE.*

*Studies, Scientific and Social.* By Alfred Russel Wallace. 2 vols. Illustrated. (London: Macmillan and Co., Ltd., 1900.) Price 18s.

IN addition to being one of the originators of the modern doctrine of animal evolution and one of the leading pioneers in the study of the geographical distribution of the earth's fauna, Dr. Russel Wallace is a writer noted for such a fascinating style and such a happy mode of presenting his views, that any work from his pen is sure of a hearty reception on the part of the more thoughtful section of the reading public. And even those who by no means agree with all his views—whether on scientific or social questions—cannot fail to admire the fairness with which he treats debatable points, and the temperate manner in which he replies to and discusses the objections raised by his critics.

The essays and articles collected in the two volumes before us embrace an extraordinarily wide range of subjects, and cover a period of no less than thirty-five years, the earliest of them being published as long ago as 1865, while the latest saw the light as recently as 1899. The variety of subjects discussed is alone a testimony to the wonderful mental capacity of their talented author, while the number of the periodical publications from which they have been culled bears evidence to the popularity of his writings. Those embraced in the first volume relate exclusively to various branches of geological and biological science, while those in the second are devoted to educational, political, sociological and kindred subjects. With the exception of a brief reference to two articles in the second volume dealing with museums as educational

establishments, our notice will be restricted to the section connected with natural science.

It may be as well to mention, before going further, that in a work dealing with such a variety of subjects as is the case with the one before us, it would be a practical impossibility to review it critically within any reasonable space; and we must accordingly content ourselves with a brief survey of its principal contents.

Quite apart from the general interest of the book, as dealing with some of the most important biological and social topics of the day, there can be no question that, from the point of view of the working naturalist, the author has been well advised in publishing the essays of which it is composed in a collective form. Several of them are replies to criticisms on some of Dr. Wallace's views, while others, such as the one on the affinities and origin of the Australian and Polynesian races, contain entirely new views and theories. Before their publication in their present form it was, consequently, exceedingly difficult for a writer on any particular zoological subject to be sure that he had seen Dr. Wallace's last words on that subject. Indeed, the writer of this notice feels that he owes an apology in that, when writing an essay in favour of the Caucasian affinities of the Australians, he was unaware that Dr. Wallace had previously urged the same view. In one respect, the omission may perhaps be regarded as fortunate, as it permitted the same conclusion to be reached independently.

From the fact that some of the articles are more or less recent while others are of considerable antiquity, it will, of course, be evident that they have by no means all an equally important bearing on disputed questions of the day. The one on the evolution and distribution of animals, for example, dates from the early days of the study of that subject, whereas that on the distinction between the Palearctic and Nearctic regions deals with a proposed amendment of the author's classification.

The first five essays deal mainly with the agencies that have modified certain parts of the surface of the globe, the alternations that have taken place in the distribution of sea and land, and the state of the interior of the globe. In the main, Dr. Wallace is a strict uniformitarian, and his account of how even the deepest and steepest mountain valleys have been eroded by the ordinary denuding agencies will be read with interest. He is fully convinced of the important part played by ice in the modelling of the earth's surface during the Pleistocene period, and pays no heed to the arguments that have been urged of late years against the former existence of an ice age. Whether his adherence to the theory of the erosive action of ice as the dominant factor in the formation of lake-basins will commend itself to many modern geologists may be doubtful; and the denial by some that such a thing as a true rock-basin exists would, if fully confirmed, to a great extent annul several of his arguments.

In the essay on the permanency of ocean-basins the author, in the main, pleads in favour of his original views, and offers some objections to the theory of large continental and ocean changes which demand respectful and serious attention on the part of those who differ from him in this respect. Nevertheless, in granting the possibility that such alternations of sea and land may have extended to such parts of the ocean as lie approximately within the

limits of the two thousand fathom line, he has conceded much that is demanded by his opponents. Indeed this extension of the limits (formerly fixed at the 1000 fathom line) would practically admit of a land connection, at least by way of Antarctica, between South America and Africa, if not also between South America and Australia. And to learn how strong is the evidence in favour of such connections, the reader need only consult the paper recently read by Prof. Scott before the British Association.

Among the essays on descriptive zoology, attention may be confined to the one on monkeys and their affinities, which originally appeared (without the illustrations) in the *Contemporary Review* for 1881. It is an interesting and well written survey of the leading groups of these animals, in the course of which the author raises the question whether the Primates, other than man, are rightly regarded as the head of the animal kingdom. In this article, as in several others, we think it a pity that the author has not seen fit to adapt his nomenclature to that now current among systematic zoologists, and that he clings to such discarded names as *Cynocephalus*, *Mycetes* and *Cuscus*. Moreover, we notice on page 156 the misprint *babuino* for *babuin*; and we venture to affirm that the statement on the following page to the effect that the mandrill in size and strength is not much inferior to the gorilla is scarcely consonant with the facts—certainly not so far as size alone is concerned.

Of the articles on geographical distribution, two deal with North American flowers and trees and their differences from those of Europe, a third treats of the beetles of Madeira and the inferences to be drawn from them, while to the other two a brief reference has been already made.

Five essays are devoted to the theory of evolution, among which special attention may be directed to the one dealing with the question of the possibility of acquired characters being inherited, which appeared in the *Fortnightly Review* for 1893. At the conclusion of this article Dr. Wallace remarks "that no case has yet been made out for the inheritance of individually acquired characters, and that variation and natural selection are fully adequate to account for those various modifications of organisms which have been supposed to be beyond their power."

To many readers the three essays on anthropological subjects will perhaps prove the most interesting in the whole book. The first of these deals with the Polynesians and their migrations, the second gives an account of New Guinea and its inhabitants, and the third treats of the affinities and origin of both Polynesians and Australians. In the title of the second member of this trilogy the author has scarcely done himself justice, since, in addition to describing the Papuans, he gives a most interesting summary of the leading features of the mammalian and avian fauna of the largest island in the globe. The illustrations of some of the recently discovered types of birds of paradise in this article are among the most exquisite examples of photogravure that have come under our notice. Well selected, too, are the anthropological photographs with which these articles are illustrated, and especial attention may be directed to the juxtaposed portraits of an Australian

and a Yeso Ainu, which the author considers afford important evidence in favour of the Caucasian affinities of the former race. Mr. Wallace, in opposition to the views of the late Sir William Flower, likewise advocates a Caucasian descent for the brown Polynesians. The use of the bow and arrow by the Papuans, and not by either the Australians or the Polynesians, is, he remarks, a notable ethnical fact. It clearly, indeed, serves to differentiate the Australians from the Papuans and other Melanesians; but then, on the other hand, it might also be used as an argument that the Polynesians are related to the Malays, who likewise never use the weapon in question. It may be remarked as somewhat strange that, when the author alludes to the possession of the boomerang by races other than the Australians, he omits to mention its use by certain Indian jungle tribes.

With one article on the problem of instinct, and a second on human selection, the latter worthy the best attention of those interested in the well being and improvement (both physically and morally) of the human race, the first of these two most interesting volumes is brought to close.

In the second volume our remarks, as already said, will be restricted to the first two articles, one of which deals with how an ideal zoological museum should be constructed and arranged in the best manner for educating the public, while the second discusses how near an approach to this ideal is made by the museums of the United States. The author seems to be clearly of opinion that a most important, if not, indeed, the prime function of a museum should be as an educating medium. In his main ideas he is in accord with the opinions of the late Sir William Flower, and he points out that a perfect museum ought to embrace everything from the lowest worm to the highest product of human art and skill. He also advocates the exhibition of a comparatively limited number of specimens (which should be the best that money can obtain), in order not to confuse by multitude, and also that these should have ample space. The allotment of separate chambers to particular groups is likewise made a point, because, as he urges, a long gallery only serves to distract the attention of the visitor from the objects immediately before him to those ahead, and thus inevitably leads to hurry and an imperfect study. Lastly, but not least in importance, Dr. Wallace advocates the arrangement of zoological collections according to local faunas, instead of according to the affinities of the animals themselves.

Whether or no this faunistic arrangement should be adopted for the main exhibited series in a museum may be an open question; but there can be no question at all that such an arrangement should be displayed in every national museum. The American Museum of Natural History shows in one case the animals living within a fifty-mile radius of New York, and in a second the characteristic members of the European fauna; and nothing of this nature can be of higher educational value. With regard to limiting the number of specimens exhibited, a difficulty occurs, since a museum—at any rate in England—has at least two distinct classes of visitors for whom to cater. For the ordinary lover of natural history, as well as for the general zoological student, to say nothing of "the man in the street," a small number

of specific representatives of various groups is not only sufficient, but forms the best kind of exhibit he can be shown. On the other hand, although the working zoologist will find what he requires in the study series, the sportsman—and in Britain his name is legion—expects to find exhibited every species and race of furred and feathered game he may encounter in the course of his wanderings. To find a *via media* out of this difficulty is a problem which will probably long continue to vex the mind of the museum curator; but, like other difficulties, it will one day have to be faced and conquered.

Our best wish to the many readers whom Dr. Wallace's two volumes will undoubtedly attract is that they may derive from their perusal an amount of interest and instruction equal to that which has accrued to the present reviewer in the accomplishment of his task.

R. L.