

maintains that we are not justified in destroying them without adequate reasons. "The struggle for existence may force us to kill them for food or for our own self preservation; but the mere sportsman, and still less, he who destroys animals simply in order to display his skill in shooting, can show no moral sanction for his acts." And after a strong protest against cruelty to animals, he adds:—"Fortunately for us, the memory of the unutterable wrongs which dumb animals have sustained at man's hands cannot have been transmitted by them from generation to generation, or assuredly the entire Animal Kingdom would rise up in fierce rebellion against the common oppressor!"

On the whole, the book is very pleasingly and clearly written; it is divided into a number of short chapters each treating some well-defined aspect of the question; it contains examples of the best and most instructive facts illustrative of animal intelligence, and it is pervaded by a feeling of sympathy for the whole of animated nature. It is a pity that it is not issued in a more attractive form, the paper covers being hardly suited for such a book; but it is nevertheless well adapted as an introduction to the study of the subject, and will be especially interesting to those who think highly of the intelligence as opposed to the mere instincts of animals, and who are not afraid to recognise that even in their mental faculties and emotions the lower animals have much in common with ourselves.

ALFRED R. WALLACE.

#### OUR BOOK SHELF.

*The Principles of Agriculture.* By G. Fletcher. (Derby: The Central Educational Company, Ltd.)

THIS little book is essentially a note-book of lectures given by the author, at the instance of the Technical Education Committee of the Derbyshire County Council, to schoolmasters and others intending to become teachers of agriculture. The syllabus covers the ground usually gone over in such a course, the arrangement of subjects being somewhat similar to that adopted by Fream in his well-known "Elements." The book contains, in a small space, a good deal of information, and, at the same time, indicates points with which the student should make himself acquainted, but which could not be given in detail in a work of this kind. It seems to be carefully written, and, on the whole, very free from errors; it will, no doubt, be a useful guide both to teachers and students of agriculture.

*Au Bord de la Mer: Géologie, Faune, et Flore des Côtes de France.* Par le Dr. E. L. Trouessart. (Paris: J. B. Baillière et Fils, 1893.)

IT often happens that people who go to the seaside for a holiday would be glad, if they could, to learn something about the scientific meaning of the objects by which they are surrounded. They have neither time nor inclination for the study of elaborate works, and as a rule there is not much to be gained by the perusal of local guide-books. Persons of this class in France will find exactly what they want in the present volume. The author gives first a sketch of the geology of the French coasts from Dunkirk to Biarritz, then deals with such marine plants as are likely to interest the reader, and finally presents an account of marine animals. The style is clear and unpretending, and the text is illustrated with no fewer than 149 figures.

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#### LETTERS TO THE EDITOR.

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#### Mr. H. O. Forbes's Discoveries in the Chatham Islands.

IN a recent letter in NATURE (vol. xlviii. p. 27), under the above heading, Mr. Wallace has done me the honour to make some observations on the conclusions I have arrived at on other discoveries I have made in the Chatham Islands, and on the evidence adduced in my paper read before the Royal Geographical Society on March 12 last, *i.e.*, that an Antarctic continent—which I may name Antipodea—is necessary to explain the distribution of life in the southern hemisphere. Mr. Wallace says, "It is this tremendous hypothesis which appears to me to be not only quite unnecessary to explain the facts, but also to be inadequate to explain them. If one thing more than another is clear, it is that these comparatively small flightless birds were developed, as such, in or near to the islands where they are now found, since they could not possibly have arisen on any extensive land inhabited by carnivorous mammals and reptiles, and, if introduced into such a country could not long survive." If by this Mr. Wallace means that only the flightlessness of these birds, apart from their general structure as members of the genus *Aphanapteryx*, arose in or near the islands where they now are, he still leaves the, to me, greater difficulty unexplained how two so closely related species of the same genus should have arisen in regions separated by nearly one half of the circumference of the globe. For it has to be remembered that *Aphanapteryx* belongs to the *Ocydromine* group of the Rails, which is quite unknown in the northern hemisphere, and, therefore, to have reached "Lemuria" (the ancient land of which Madagascar, Mauritius, Bourbon, Rodriguez, and the Seychelles, are the fragments) the genus must have arisen independently in both regions where its species are now found, or it spread from one or the other centre, or from some common land *by flight*. Mr. Wallace has himself pointed out that to explain the presence of the flightless *Notornis* and *Ocydromus* in two groups of islands in the New Zealand region requires a land connection, for it has been hitherto considered an axiom of geographical distribution that the regions inhabited by the same genus or species have been continuous, or have been, at all events, such as to afford possibilities of migration from one to another. If *Aphanapteryx* could have spread from the Chatham Islands to Mauritius by flight, surely *Notornis* and *Ocydromus* did not require a land connection to reach from New Zealand to the nearer outlying islands, for they may equally have lost the use of their wings only after they reached their present homes.

When Mr. Wallace asserts that these birds "could not possibly have arisen on any extensive land inhabited by carnivorous mammals and reptiles," he affirms what does not really appear to me to carry with it conviction without more proof. Rails belong to a family of birds that have become of world-wide distribution, not improbably because of the habits of its members enabling them to escape destruction. They are better runners than flyers; they are water and marsh-loving birds, many of them living in reed and rush brakes, and the dense vegetation surrounding marshes, amid which pursuit is difficult or impossible. I was much struck when in the Chatham Islands by observing how the habits of the small *Ortygometra taiuensis* protected it. The upland districts of Wharekauri are covered by a very dense rush-like vegetation—the *terahina* of the natives—in which this little Rail lives. We hunted over acres and acres of country with the aid of a dog well trained to pursue and catch this species, but only after two days did we succeed in securing a specimen. We could see that the dog disturbed plenty of birds, but so rapidly could they make their way through the *terahina* that they all escaped, for they never took to flight. The *Cabalus modestus* is a nocturnal bird hiding securely in hollow trees and grass thickets all day. *Notornis* inhabited, and perhaps still inhabits, the dense scrub of the south-western portion of New Zealand, and could have there escaped the severest persecution of carnivorous animals and reptiles. But even if *Aphanapteryx* had been subjected to the incessant and successful attacks of such enemies, its extinction, whether early or late, would de-