

and with advantage to the public. It is extraordinary how limited is the vocabulary of a large portion of even the well-educated section of the public: and it is the too free use of technical terms in the better class of popular natural histories which drives people to those of an altogether inferior description. Another point to which we would draw attention in connection with the "Coral Guide" (which, by the way, includes sponges and various other low invertebrates) is the advisability of omitting the names of describers of particular species or structures. Such names as Wyville Thompson, Hickson, Duerden and Shipley are familiar enough to zoological students, but they are quite unknown to the outside public for whom the book is intended.

A feature of the "Coral Guide" is the wealth and beauty of the illustrations, which render it a most wonderful shillingworth, altogether apart from its high value as an excellent introduction to the groups of animals of which it treats. A number of new illustrations also characterise the seventh edition of the "Mammal Guide," which, for reasons apparent to those in the "know," the present writer is debarred from either criticising or commending.

R. L.

TERRESTRIAL MAGNETISM.

AN interesting paper describing the results of an investigation to determine to what extent magnetic disturbances of the needle are connected with the geological conformation of a selected mountainous district has recently been published.¹

The well-known inquiry into the relation between the magnetic and geological constitution of Great Britain and Ireland conducted by Rücker and Thorpe has been before us for some six years, and in the present paper we have the report of results obtained in another country and in later years having the same object in view.

The region selected for the observations was the Kaiserstuhl, a mountainous district in the neighbourhood of Freiburg in Baden, of which exact topographical and geological surveys had been made, and it is from this source that the maps accompanying the paper and upon which the results of the observations are exhibited were obtained.

The base station was at Freiburg on the spot occupied by Lamont in 1852, but the several observations were compared with a station nearly in the centre of the Kaiserstuhl, at which the magnetic elements were considered normal. In all, 382 determinations of the horizontal force, 140 of the inclination and 137 of the declination were made, and the epoch assigned is 1898·7, but no corrections for diurnal inequality were made. The resulting disturbances from these observations are shown on a special map of "Isanomalen."

The author arrives at the following conclusions:—(a) That wherever the geological conformation is of basalt, there he experiences disturbance of the needle partly due to permanent magnetisation of the basalt; (b) that the principal disturbances are caused by compact masses of basalt with a North Pole acting vertically upwards—or nearly so—on the north-seeking end of the needle, and the magnetism of these masses is not due to induction from the earth.

With (a) we may concur as to a connection being frequently found between the geological formation of basalt and magnetic disturbance of the needle, but it has been also shown that basalt may be present in large masses and certain forms without causing any such disturbance. The conclusion in (b) can hardly be accepted, for it is well known that in the northern hemi-

sphere the north-seeking end of the needle is generally attracted downwards by locally disturbing rocks, pointing rather to induction from the earth as the cause of the magnetisation of basalt.

In order to find an explanation of the causes of the observed disturbances of the needle, pieces of basalt were taken from the surface and from a working quarry, and their several effects upon a compass observed, but no information of importance was obtained from the experiments. The question of the effects of lightning on the magnetism of rocks is also discussed, but dismissed as untenable.

It should, however, be remarked that the author does not look for more than general results from the observations as carried out, but they certainly form the nucleus of a further survey from which more definite results might be obtained as to the connection between geological conformation and magnetic disturbances.

Having considered some of the effects of local magnetic disturbance in Germany, we may now turn to the remarkable effects of such disturbance on the magnetic declination in the United States as shown in the latest chart¹ of lines of equal value of that element for 1902.

This chart is a continuation of the series published by the United States Coast and Geodetic Survey, and gives true isogonals for every degree. An examination of the lines shows that some of the most remarkable disturbances occur in mountainous districts, especially in the State of California. With its lines of equal annual change of the declination this chart is decidedly valuable, both from the practical and scientific points of view.

The values of the magnetic dip and declination given in Father Doyle's pamphlet² are the result of eight years' photographic record taken at the Manila Central Observatory during the period January 1, 1890, to December 31, 1897. The position of this observatory has been specially selected with a view to avoiding magnetic disturbances either in the locality or the materials of the building. Curves of the mean hourly variation of the declination for each month of the eight years are given, and also curves of the mean annual and mean semi-annual variation of the dip and declination. The chief interest, however, of the data recorded lies in the values of the secular variation of both elements for the epoch 1887-99. In these we have corroborative evidence of the small secular change of the declination, and the large change which is so marked in the dip, which has taken place during the epoch 1880-1900 at the observatories of Bombay, Batavia, Manila and Hong Kong. A chart of the isogonic and isoclinic lines corresponding to the epoch January 1892 for the region comprised between the Philippine Islands and Southern Japan is appended.

THE "NATURE-STUDY" EXHIBITION.

THROUGH the courtesy of the Royal Botanic Society, the aims of which are by no means so purely social as some of its present interests might suggest, a "Nature-Study" Exhibition is now being held in Regent's Park. Never has there been a better undertaking, nor could one be set on foot, which would do more to bring about a rational system of teaching such as is now looked forward to, whereby the pupils may be keenly interested instead of bored and their work made a labour of love instead of a dreary task.

There have long been in this country those who appre-

¹ "Chart of Lines of Equal Magnetic Declination and Annual Change for 1902." (Published by the United States Coast and Geodetic Survey, February, 1902.)

² "Magnetic Dip and Declination in the Philippine Islands." Brief notice of the same by Rev. John Doyle, S.J., of the Manila Central Observatory (1901).

¹ "Erdmagnetische Untersuchung im Kaiserstuhl," von G. Meyer. (Published in the *Berichte der Naturforschenden Gesellschaft zu Freiburg* i. Br. Band xii., 1902.)