

most severe critic must admit that the style, without being in the least laboured, is far superior to that of the ordinary writer on natural history, and the book is consequently in the highest degree readable. Many a Wiltshire man, woman, and child will have reason to be grateful to Mr. Alfred Charles Smith.

A HAND-BOOK FOR TRAVELLERS.

Führer für Forschungsreisende. Anleitungen zu Beobachtungen über Gegenstände der physischen Geographie und Geologie. Von Ferdinand Freiherr von Richthofen. (Berlin: Oppenheim, 1886.)

IT is now thirteen years since Dr. Neumayer issued his "Anleitung zu wissenschaftlichen Beobachtungen auf Reisen," a joint production of himself and representatives of various departments of science, the geological section having been contributed by the present author. The volume now under consideration is virtually an enlarged and completely revised edition of that section, which it seemed desirable to publish separately. A re-issue of the complete work is, however, in contemplation. The qualifications which Von Richthofen possesses for the task he has undertaken are of no common order. Himself a traveller of wide experience, whose work on China deservedly ranks as one of the classics of geographical literature, he brings to bear upon his subject a wealth of practical knowledge combined with scientific attainment, in which few are his equals.

In the preface it is explained that the primary object of the work is to enable those travellers whose previous scientific training is not extensive, such as missionaries, merchants, and others, who may be thrown in regions but little explored, to make observations which shall be of permanent value. Under these circumstances, no attempt is made to furnish the reader with references to the literature of the subject which would almost certainly be inaccessible to him, although notice is taken here and there of modern treatises on particular questions. The body of the work opens by an introduction, the scope of which may best be indicated in a general way by stating that it contains such headings as "Outfit," "Modes of Travelling," and "Miscellaneous Practical Hints." These last are especially valuable, and might with advantage be carefully studied by anyone who is starting on a first expedition, on account of their eminently suggestive and practical character. The emphasis laid upon the necessity of noting all observations on the spot, and even upon such minutæ as having the pencil suspended round the neck so as to be always ready, indicates an experience of the temptations to procrastination which beset travellers in common with humanity at large. Among other divisions of this section may be mentioned "Measuring and Drawing," in which sufficient directions are given for mapping unexplored countries in a preliminary fashion, and also "Climatic and Biological Observations," the latter of which are treated with extreme brevity, as not falling within the author's special province.

The next portion of the book is entitled "Observations upon Externally Modifying Processes," and includes chapters upon rocks and soils, on springs and flowing water. It contains a dissertation of some length on the important subject of glaciers, in which the phenomena accompanying their present existence, as well as the

traces of their past action, are carefully described. In another chapter an abstract is given of the present state of our knowledge regarding coral reefs and islands. In addition to the time-honoured theory of Darwin, the most recent researches of Semper, Rein, Murray, and Studer are summarized; one misses, however, the name of Agassiz in this connection, and it is noticeable that, although Dana's soundings off Tahiti are quoted in some detail, no mention is made of the series executed by the *Challenger*, although their results agree well with the author's diagrammatic section of a reef. No one theory is embraced to the exclusion of all others, but stress is laid upon the need for further investigation, and upon the fact that "each reef has its own special history of origin and development." Upraised coral reefs are indicated as being likely to throw light on the question—a suggestion which has been independently carried out by Dr. Guppy in the Solomon Islands with such brilliant results. A few pages give what is known regarding the changes of level of the ocean, and the terms "positive" and "negative displacement" are adopted instead of "sinking" and "upheaval" of the land respectively.

The third section is devoted to "Observations on the Crust of the Earth, on Rocks, and on Mountain Structure." It contains an outline of the principal facts of petrology and of stratigraphical geology.

The author treats his subject in considerable detail; his volume occupies more than 700 pages—that is, a somewhat larger bulk than the whole of Neumayer's original work. Indeed, if a fault is to be found in the book, we should be disposed to say that, considering the fact that only one aspect of Nature is discussed, the amount of detail is rather excessive. If botany, zoology, anthropology, and all the other matters which have an equal claim upon the traveller's attention, were elaborated in the same fashion, the result would be an encyclopædia of no small dimensions. The work is, however, thoroughly practical in character. There are no lengthened discussions upon abstract questions, but divergent theories regarding unsettled points are summarized in such a way as to indicate how both the traveller who has time at his disposal, and also he who is compelled to hasten through the country, can each make the best use of their respective opportunities.

W. E. H.

OUR BOOK SHELF.

Geometry in Space. Edited by R. C. J. Nixon, M.A. "Clarendon Press Series." (London: Henry Frowde, 1888.)

THIS book is a sequel to "Euclid Revised" by the same author. It consists of one hundred pages, divided into three chapters and an appendix. The first chapter is devoted to the discussion of planes and solid angles, covering much the same ground as Euclid's eleventh book; it contains, besides, some very useful notes on elementary perspective and the drawing of solid figures. This is an excellent feature of the book, and the author might with advantage have given more than a couple of pages to it, for there is no doubt that, to most students, the representation of solid figures, other than the simplest, is a real and often a permanent stumbling-block to the development of the science in their own minds. The second chapter is concerned with polyhedra. It begins with Euler's theorem establishing a linear relation between the numbers of edges, corners, and faces, and Listing's