

same time, we are bound to notice what appears a very serious defect in the volume. The author has ignored recent microscopical research, and instead of giving that method a distinct and prominent place in his account of the investigation of rocks, he contents himself with the old "dry way" and "wet way" of analysis. In so doing, he tacitly confesses himself to be behind his time. His compilation, useful as it is, will, we hope, ere long be superseded by another, when petrography has had time to compose itself again into something like clearness and symmetry. In the mean time, the student who wishes to go more fully into the matter, will still find Zirkel's "Lehrbuch" his best guide, though even that valuable manual is fast getting out of date; owing to the great progress which the last few years have witnessed in this branch of geology. That progress has been largely shared in by Zirkel himself, as will be shown in a subsequent paper.

ARCH. GEIKIE

#### OUR BOOK SHELF

*Der Zoologische Garten.* Zeitschrift für Beobachtung, Pflege und Zucht der Thiere. Herausgegeben von Dr. F. C. Noll. XI. Jahrgang, 1870. (Frankfort a. M.) (London: Williams and Norgate.)

THE "Zoological Garden" is, as its name imports, a periodical especially devoted to all that is connected with the maintenance of animals in what are commonly called "Zoological Gardens." Having been founded some ten years ago by the Zoological Society of Frankfort-on-the-Main, it more especially relates to the affairs and condition of the small but well-arranged garden belonging to that Society, which is situated in the environs of that free and ancient city. It may appear somewhat surprising that a journal devoted to a subject of apparently so limited an extent can achieve sufficient circulation to command success. But the number of zoological gardens, aquarium houses, and similar establishments in Germany, has considerably increased of late years, and their institution in nearly all the principal cities of the Fatherland has been very favourably received, so that it is easy to understand that a considerable amount of popular interest in these subjects has been excited. Hamburg, Cologne, Dresden, Berlin, Hanover, and Munich, have all flourishing establishments of this description, and although the Zoological Garden founded some years ago in Vienna has come to an untimely end, yet in every part of what is now the new Empire of Germany the prospects of such institutions seem to be extremely favourable. But our "Zoological Garden" by no means entirely confines its attention to animals in captivity. It likewise contains many excellent articles relating to the habits of birds and beasts in a state of nature, so as to embrace many of the well-known attractions of a popular magazine of Natural History. Occasionally also more strictly scientific articles, such as that of Professor Pagenstecher on the Anatomy of the Cape Hunting Dog (*Lycaon pictus*) in the numbers for July and August last year, are given, so that the result is a zoological miscellany of a very various character. The woodcut illustrations are, it is true, perhaps not always in the highest style of art, but we have seen many inferior in English popular works of Natural History, and they have generally the merit of being tolerably correct. To such of our readers therefore as are growing weary of the "Zoologist" and cannot appreciate the learning of the "Annals," we recommend a trial of the "Zoological Garden," it being pre-supposed, of course, that they understand the language in which it is written (which in these days is a matter of course!). The subscription-price is very

moderate, amounting only to about 8s. per annum for the twelve numbers, and the journal is regularly forwarded through the post to this country. P. L. S.

*The Marvels of the Heavens.* By Camille Flammarion. From the French, by Mrs. Norman Lockyer. With 43 Illustrations. (London: R. Bentley, 1870.)

THE French certainly have the art, which we have not, of putting science in an attractive form to the popular mind—attractive, and yet not at the expense of scientific accuracy. Good service is, therefore, done by the translation into easy and graceful English of works like this by M. Flammarion. From the very commencement he carries the reader with him by his enthusiasm. Instead of starting with a bare statement of facts—that the Sun is the centre of the solar system, that it is so many hundred thousand miles in diameter, and has this, that, and the other planet revolving round it at such and such distances, he takes his reader out with him, as it were, to behold the heavens on a starry night; explains how it is that we see the sun only during a portion of the twenty-four hours; and speaks of the arrangement of the stars in clusters and nebulae. Then he descends from the stars as a whole to a particular one, the Sun, and proceeds to describe in detail the solar system. And, throughout, the subject is treated with a graceful fancy and a wealth of illustration which make it very charming. Old Greek myths and fables of the astrologers, quotations from Byron and Lamartine, from Bryant and Victor Hugo, anecdotes of the value of astronomical knowledge, are brought in to point the moral and adorn the tale, and never appear to come amiss, or to be beside the mark. We must say a word about the illustrations, which are extremely good. We have never seen anything that so well recalls to our mind the appearance of the heavens through a powerful glass as Fig. 21, a part of the constellation of the Swan, as seen through the telescope; on the opposite page is placed, by way of contrast, the same seen by the naked eye. Author, translator, and artist have combined to produce a book which ought to be in the hands of every one who desires an introduction to "The Marvels of the Heavens." B.

*Geology.* By Prof. John Morris, F.G.S., and Prof. T. Rupert Jones, F.G.S. First series. Heads of Lectures on Geology and Mineralogy, in several courses from 1866 to 1870, at the Staff and Cadet Colleges, Sandhurst, by T. Rupert Jones, F.G.S. (London: Van Voorst, 187c.)

THIS book can hardly be called a Manual of Geology; it is rather the *avant-coureur* to the book which is to be written presently. It is a series of outlines for a course or courses of lectures, furnishing in a brief and concise form the heads or texts for any number of geological discourses which a Science teacher may be called upon to give: or the student may take it as his guide to the main lines and branches of geological study, along which he may have to pursue his readings in preparing himself, either alone or with the assistance of a "coach," to pass his "B.Sc.," or other examination at any one of the Universities. Now-a-days, when a man has to coach up so many different subjects in so short a time, it is obvious that, the more handy and concise a book is, the more useful will it be in helping to the desired end. One thing more seems to us to be needed in order to render this book of practical utility to the *uninitiated*; it is, to give, under each head, references to the authors (with chapter and verse) whom the student or teacher should consult, to gather more fully what is here only hinted at, often in but six words or less. To those who are already read up in Geology and Palæontology, the book is a most useful form of "Remembrancer," containing besides numberless facts—the key-notes to whole discourses on the earth and its past history.

H. W.