

OUR BOOK SHELF.

Plane Trigonometry for the Use of Colleges and Schools.

With numerous Examples. By I. Todhunter, F.R.S.
Revised by R. W. Hogg. (London: Macmillan and Co., 1891.)

TODHUNTER'S "Trigonometry" is a very familiar friend of ours, and we have now before us a bundle of letters which we received from the author in 1861 and 1862, in reply to our criticisms and corrections of the early editions. The first edition swarmed with small *errata*, for the pointing out of which we received warm thanks. It was a good book for some years, on account of the excellent collection of problems, but of late it sadly wanted bringing up to date. Mr. Hogg has done his work well, but possibly he would have produced a better independent book. The first 200 pages have undergone very little change, and we have only noted here and there an interpolated article. Chapter xviii., "Miscellaneous Propositions," contains several novelties (as contrasted with the last edition we have of the original work), such as geometrical proofs of familiar formulæ and graphs of the trigonometrical functions. There are numerous important additions in chapters xxi.-xxiv., which bring this part of the work more *en rapport* with present day requirements, notably Schlömilch's resolution of $\sin \theta$ into factors, and a too brief account of hyperbolic functions. The prime feature is the addition of a very great number of excellent recent exercises in all parts of the subject. The work forms a good school-book, and will meet the requirements of a large number of students.

Lessons in Astronomy. By C. A. Young, Ph.D., LL.D.
(Boston, U.S.A., and London: Ginn and Co., 1891.)

THIS is the third of a series of text-books recently prepared by Prof. Young for use in schools and colleges of different grades. The two previous ones have already been noticed in NATURE (vol. xxxix p. 386, and vol. xli. p. 485). The present work is described on the title page as "a brief introductory course without mathematics, for use in schools and seminaries." The three books have much in common, and each one has many good points. We cannot help feeling, however, that the steps between them are too small. Almost exactly the same ground is covered by each, and they differ chiefly in the amount of previous knowledge assumed. But the acquaintance with mathematics required for a thorough comprehension of the "General Astronomy" is by no means great, and even for the "Lessons" a certain knowledge of geometrical principles is essential. If we must needs have three books, the "General Astronomy" contains too little, and the "Lessons"—a book of some 350 pages—contains too much.

The chief variation calling for notice is in the portion dealing with uranography. This now forms chapter ii., and, with the aid of the maps, forms a fairly complete and easy guide to the constellations. The notes on the legendary mythology of the constellations, which have been added for the benefit of students not acquainted with classical literature, gives this chapter an additional interest.

The book is brought well up to date, and is a model of good printing.

Cosmical Evolution: a New Theory of the Mechanism of Nature. By Evan McLennan. (Chicago: Donohue, Henneberry, and Co., 1890.)

The author states that the essential principle of the new theory is "that every known heavenly body is connected with its neighbouring heavenly bodies by means of real, material bonds, and that every phenomenon of the universe, without exception, is due solely to the action of bodies upon one another through, and by means of, these bonds which join them together" (p. 48).

Among the principal evidences in favour of the existence of this material planetary connection is that "we actually see them with the naked eye" in the zodiacal light and in the streamers of the solar corona.

The theory is of a very general nature, and includes not only cosmical but terrestrial phenomena, such as ærial and aqueous tides, terrestrial electricity and magnetism. The author is of opinion that "the greater tidal wave is due to the sun, and the lesser to the moon" (p. 291).

The conditions of prelunar and other races of mankind are also discussed (p. 360). The work consists of 399 pages. There is no index.

The Telescope: an Introduction to the Study of the Heavens. By J. W. Williams. (London: Swan Sonnenschein and Co., 1891.)

THE writer of this book is author of "British Fossils, and where to Seek Them," and "Land and Water Shells, &c." In his preface he quotes with approval the adage, "Ground your knowledge of any special group on a general knowledge of nature as a whole." This is perhaps why he now turns his attention from shells to astronomy. However this may be, the work has been carefully compiled, and is to be recommended as a safe guide. Some of the illustrations are excellent.

LETTERS TO THE EDITOR.

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Silver Lodes and Salt Lakes.

SINCE the discovery, some five or six years ago, of the extraordinary Broken Hill lode of silver-bearing ores, the public excitement on the subject in this part of the world has been attended with comparatively little scientific interest in regard to the geological features of the argentiferous country and the probable origin of deposits so vast and so remarkable in character; yet I believe that an examination of the main topographical and geological features of the eastern parts of South Australia and the western parts of New South Wales will probably throw more light upon the interesting subject of the origin of argentiferous lodes than the study of any other now known part of the globe; and, as I have had an opportunity of going closely into the matter during a recent visit to Broken Hill, I propose to lay briefly before your readers a few facts which seem to afford presumptive evidence in favour of the supposition that salt lakes and silver lodes are causally connected.

An examination of the ores *in situ* at Broken Hill, and especially in the portions of the lode which are known as blocks 10 and 11, reveals the fact that stratification almost exactly similar to that of an ordinary alluvial deposit is practically universal throughout the lode. So obvious has this been from the very beginning of the working, that almost every mining man who has had anything to do with Broken Hill has remarked upon the very obvious fact that the ores are to be ascribed to an aqueous origin. The fissure in which the lode occurs varies from a few feet to seventy or eighty yards in width, and has almost vertical walls. Within these boundaries the stratified deposits of carbonates and chlorides are intermingled with immense bodies of kaolin and sulphides, with a considerable amount of an interesting silicate of zinc also carrying silver and lead. The Barrier District is one of the driest in the whole of this very dry continent, and there is no river within about seventy or eighty miles. The few intermittent watercourses which exist in the locality do not suggest anything but a dry and arid climate. In fact, the greatest difficulty now met by the mines and by the town of Broken Hill, which contains about 27,000 inhabitants, is the scarcity of water, and the doubtful nature of any catching grounds that have been suggested. If, therefore, water was the agency by which the deposits of