

THURSDAY, SEPTEMBER 19, 1901.

WIRELESS TELEGRAPHY.

Drahtlose Telegraphie durch Wasser und Luft. Based on Lectures delivered in the Winter of 1900 by Prof. Dr. Ferdinand Braun, Director of the Physical Institute of the University of Strassburg. Pp. 68. (Leipzig: Veit and Co., 1901.) Price M. 2.

THE rapid development of wireless telegraphy which has taken place in the last few years has called forth many articles in the scientific and technical papers, but as yet but few single treatises or text-books. Prof. Braun is known as an experimenter in this branch of electrical science, and the pamphlet under notice treats of the subject from a more or less popular point of view and also gives a short sketch of some of Prof. Braun's own experiments. The first chapter is an interesting historical *résumé* of the endeavours to signal over a distance without the use of intervening wires. It is interesting to observe that the discovery that the earth could serve as a return conductor for the ordinary telegraph first led up to the thought that the other wire could also be replaced by the earth or air or other medium. In one point we think Prof. Braun's remarks are hardly in agreement with the latest of our ideas—we mean in his description of the Becquerel and radium rays as being of the nature of light and electric waves. This is hardly in accordance with the corpuscle theory, which approaches, as near as it is possible at present, to an explanation of these phenomena. The chapter after this historical introduction deals with the author's own experiments on hydrotelegraphy. The guiding idea of the work was to use the property of an alternating current, with sufficiently high frequency, to flow only on the surface of a conductor. If, now, such a current be led in and out at two points of a sheet of water, the current, instead of penetrating deep down, will tend to spread itself out upon the surface of the water, and by connecting a receiving circuit at any two other points, messages can be passed between the two stations. This method of working differs in principle from that of Rathenau and Strecker, who used stationary currents. With this arrangement, if the receiver be connected to two points lying on an equipotential line, *i.e.* a line drawn at right angles to the current lines, no messages can be received. With Braun's arrangement this is different, due to the fact that the equipotential lines continually change. With experiments made at Cuxhaven, signals could be sent for a distance of three kilometres, it being proved that the effect was neither transmitted through the air nor was it an induction effect similar to Preece's experiments. All the results agree fully with the enunciated principle.

It is difficult, however, to think, in spite of the author's hopes, that this system will ever be of much practical importance in view of the development of the Marconi system.

The second chapter gives an account of Prof. Braun's experiments on wireless telegraphy proper. The results of these experiments have been published in various papers and have also received attention in this Journal. The transmitter arrangement mostly used by Braun is

that of inductive excitement. Tested against the Marconi arrangement, much better results were obtained, and Prof. Braun is of opinion that this is the best of all the devised arrangements up to date. It must be remembered, however, that Marconi has considerably improved his apparatus quite recently and has now obtained results better than those given here.

The next chapter is on "tuned telegraphy"; it is pointed out that an un- or very little damped vibration is the first condition for good syntony. This principle is now universally recognised.

In his final remarks, Prof. Braun is of opinion that the hopes that have been entertained that wireless telegraphy will ever displace the ordinary wire telegraphy are an illusion, a conclusion which is now becoming general. The spheres of usefulness of wireless telegraphy are, however, even without this, very great, and in the near future will greatly develop.

As a short, clearly written contribution to the literature of the subject, the book is worth reading. C. C. G.

OUR BOOK SHELF.

Geometrical Exercises from Nixon's "Euclid Revised," with Solutions. By Alexander Larmor, M.A. Pp. vi + 170. (Oxford: Clarendon Press, 1901.)

THIS is a collection of 823 examples illustrating the various propositions of Euclid's six books, as well as many other domains of the geometry of the right line and circle, such as maxima and minima, collinearity and concurrency, centres of similitude, coaxial circles, inversion, harmonic ranges, poles and polars, and the modern geometry of the triangle. It will thus be seen that everything of importance in the subject is dealt with. Hints are given for the solution of all the more easy questions, while fully worked out solutions are given for the more advanced. The work is therefore one of very great value both for the student and for the teacher. All the classical problems and theorems in the subject are associated with the names of their discoverers—Ptolemy, Euler, Pascal, Brianchon, Simson, &c.—and each receives ample illustration and application. This is one of the many good features of the work. Mr. Larmor is quite right in maintaining that the student of geometry should be provided with a copious and varied collection of exercises, and with an opportunity for consulting the solution of a problem or theorem in which he has failed while his interest in it is still fresh. Such an opportunity is afforded by this excellent representative collection. Doubtless much assistance in this way is derivable from the work of the late Prof. Townsend; but his book is, perhaps, too elaborate and unmanageable for the average student, on whose attention many other branches of mathematics now make large demands.

Histoire du Ciel. Par Clémence Royer. Pp. 246. (Paris: Librairie C. Reinwald, 1901.) Price 2 fcs. 50.

WHILE correctly stating a considerable number of facts, this little book, which forms the first volume of a "Petite Encyclopédie Scientifique du XX^e Siècle," by no means represents the state of astronomical science at the present time. The earlier chapters recount the history of astronomy to the time of Newton, but afterwards the bulk of the matter is descriptive and speculative. So little acquainted is the author with recent work, that among many strange ideas expounded we find the suggestion that the rings of Saturn are not composed of multitudes of small bodies but of coherent masses of ice. The illustrations are very poor, and the book should be avoided by those desiring a trustworthy guide to current opinions.