

voted to applications involving only the use of the right-angled triangle; and identities occupy a subordinate position. The final chapter deals with complex quantities, Demoiivre's theorem, and applications to analysis. The last hundred pages of the book are taken up with logarithmic and other tables, calculated to five figures. The first-rate quality of the type employed deserves special mention.

OUR BOOKSHELF.

Experimental Studies in Electricity and Magnetism. By F. E. Nipher. Pp. 73. (Philadelphia: P. Blakiston's Son and Co., 1914.) Price 1'25 dollars net.

THIS book consists mainly of descriptions of the author's experimental work, and summarises his reasons for accepting the one-fluid theory of electricity. Photographs of discharges across a spark-gap, and traces on a photographic plate due to discharges over its surface, constitute the major part of the evidence. Much work has been done, and many interesting plates are reproduced, but it is doubtful whether the experiments are quite so conclusive as the author believes. Several novel ideas are introduced, such as the existence of conducting lines or "drainage channels" round the positive or "exhaust" electrode in every kind of discharge, though it might be pointed out that this idea of a well-conducting channel is scarcely compatible with the considerable potential-slope which exists in the positive column of a discharge tube. The suggestion that gravitational attraction is due solely to the "corpuseular nebula" which permeates all matter is also novel; it is used to explain the explosive effect of discharging a Leyden jar through a wire.

Loosely-worded expressions as "the corpuseular nebula is set into a rhythmical vibration" abound, and the phraseology generally is scarcely so precise as that usually found in scientific publications. It is possible that the case made out by the author suffers considerably from the manner in which it is presented, but certainly simpler explanations than those given would seem to suffice for some of the phenomena mentioned. The deflection of a magnetic needle due to a gust of wind might conceivably be due to a magnetic storm produced by the wind, but it would be advisable to see that the oscillation box is hermetically sealed or even evacuated, before accepting the magnetic storm hypothesis!

The Principles and Practice of Judging Live Stock. By Prof. C. W. Gay. Pp. xviii+413. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1914.) Price 6s. 6d. net.

THIS volume is a very full compendium of all that belongs to a practice which has almost become a fetish in American agricultural colleges. To the student is given a card on which are printed the sections into which a horse, or some

other animal, may be divided, and the marks to be awarded to each section. A draught horse, for instance, is divided into forty sections, and, as the marks total to 100, most sections get very small and none very large marks. The marks for some of the most important parts are these, given shortly: hocks, 6; hind cannons, 2; hind fetlocks, 2; hind pasterns, 3; hind feet, 4; hind legs, 4; walk, 6; trot, 4.

Some of us who have tried it would have been exceedingly glad had this volume contained some evidence as to the educative value of the score card, because it may be doubted whether good judges are produced by its use; and because it fails to make sufficient distinction between the good and the supremely good, or the fair and the useless animal. All this, however, is rather a criticism of the system, or at any rate, of the scale of marks.

If the system be admitted good and useful, Prof. Gay's book is also good and useful. It contains good illustrations, descriptions of many breeds, an appendix containing the card marks for different breeds, and much information as to yields of milk, butter, beef, wool, and so on.

J. W.

The Elements of Electro-Plating. By J. T. Sprague. Pp. vii+72. (London: E. F. N. Spon, Ltd., 1914.) Price 1s. 6d. net.

THE publication of this little volume brings home to us the sparseness of literature on the subject of electro-plating. Its publishers have considered it worth while to re-publish, in this form, the intensely practical and well-written chapter dealing with the practice of the electro-deposition of metals which originally appeared in the late Mr. J. T. Sprague's "Electricity: Its Theory, Sources, and Applications." This classic was one of the best books of its kind when originally written, and the chapter on electro-plating was one of the best parts of the book. It is true that it is addressed "rather to experimentalists, students, and general readers" than to those "mainly intent on business considerations," and it is also true that as good electro-plating was done twenty-five years ago as now; yet one cannot but feel that the publishers would have done better to publish a new book than to re-publish an old one when dealing with a practical application of electricity. The reprint bears the new date 1914, and not the date of original publication, but perhaps some of our older readers may be able to make a rough guess at the latter from the clue given by the following passage: "It is impossible to urge too strongly, alike upon the learner and the practical operator, the advantage of keeping in circuit a suitable galvanometer . . . and galvanometers to show current in amperes are now easily obtainable." The book, old as it is, contains valuable directions and recipes, and if, instead of merely reprinting it, the publishers had employed a practical man of to-day to revise and re-write it, they would have deserved our unstinted commendation.