stories of insect behaviour that are recorded in its pages. Fabre is admittedly a difficult writer to translate, and the charm of his diction only too readily escapes if too much freedom be exercised. Mr. de Mattos's task, therefore, has not been an easy one, but he has carried it out conscientiously and with evident care for accuracy.

A First Book of Applied Electricity. By S. R. Roget. (First Books of Science.) Pp. viii + 143. (London: Macmillan and Co., Ltd., 1921.) 2*s.* 6*d.*

THE author has made a very successful attempt to give the elementary principles which underlie the useful applications of electricity and magnetism without worrying the reader with academical definitions and difficulties. The book has what we think is a great merit—namely, that it is entirely independent of the requirements of examinations. It is therefore more interesting than the ordinary treatise, and covers a much wider field.

It can be recommended to the general reader anxious to get an easily acquired, accurate, and useful knowledge of electrical matters. The ordinary student reading for examinations will also find it a useful introduction to more advanced treatises.

Perfumes, Essential Oils and Fruit Essences used for Soap and other Toilet Articles. By Dr. G. Martin. (Manuals of Chemical Technology.—X.) Pp. vii + 138. (London: Crosby Lockwood and Son, 1921.) 12*s.* 6*d.* net.

DR. MARTIN'S book is of a severely practical character; it contains much information in a very condensed form, and should be useful as a work of reference to those interested in the manufacture of the class of materials of which it treats. A large number of practical recipes is given. The section on analysis, occupying only four pages, is too brief to be of real value. No references to the literature are given beyond the mention of a few patents and a list of ten books on the subjects treated.

"*Power's*" *Practical Refrigeration.* Compiled by the Editorial Staff of *Power*. Pp. viii + 283. (New York and London: McGraw-Hill Book Co., Ltd., 1921.) 10*s.* net.

THE practice of ammonia refrigeration, including a simple account of the theory and tables of useful constants, is discussed in this volume. A number of practical hints for users of refrigeration plant, written in a colloquial style, forms about half the book, which should be useful to persons in charge of such plant.

Chemistry of Pulp and Paper Making. By E. Sutermeister. Pp. vii + 479 + 31 plates. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1920.) 36*s.* net.

THE chemical aspects of paper-making are dealt with in the volume under notice, the mechanical processes being described only in so far as they are necessary for an understanding of the chemistry. Although concerned chiefly with American practice, and less complete than the standard English treatises, the volume should be of service to chemists in paper-works laboratories. It is clearly written and well illustrated.

Letters to the Editor.

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The Directive Tendency of Elongated Bodies.

THIS letter deals with several topics, perhaps somewhat remotely related to one another, but all suggested by previous letters on the same general subject in NATURE of October 20, November 24, December 1, and December 22, 1921.

In my letter of December 22 it was suggested that Mr. Reeves's results might be explained by the peculiarities of the gravity field at the place where the experiments were made. The letter was written before Mr. Reeves's letter appeared and while I was under the impression that his experiments were all made at one place. The suggestion might be plausible as regards any one place, at least until measurements had been made there with an Eötvös balance, but would be highly improbable when applied to every one of the widely scattered places where Mr. Reeves made his tests.

Col. Grove-Hills in his latter in NATURE of November 24 directs attention to an important difference between the turning effect of the earth's field on an elongated body supported at its centre of gravity and the turning effect on a similar body when supported by flotation. He attributes quite undeserved credit to me, however, in stating that this matter is fully treated in my article in the September (1921) issue of the *American Journal of Science*. Only a very special case of the turning effect on a floating body is there treated, and that case is scarcely analogous to the one considered in recent issues of NATURE.

There are two kinds of forces acting on a floating body, namely, the force arising from the earth's gravity field, which is a body force, and the normal pressure of the fluid on the wetted surface. By well-known theorems concerning the transformation of surface integrals into volume integrals it may be proved that the effect of the fluid pressure may be replaced by the body force arising from the earth's field reversed and applied to a solid bounded by the wetted surface and by the free surface of the fluid extended in imagination into the floating body, the density of this solid being the same as that of the fluid. This theorem is proved in very elementary fashion in the ordinary theory, in which gravity is assumed to be constant in intensity and direction, but is equally true when gravity varies in intensity and direction from one part of the region considered to another.

In dealing with the turning effect on a floating body of the earth's field and of the fluid pressure, it is necessary to make some assumption regarding the depth to which the body is submerged; a natural assumption is that the body is submerged to such a depth that the downward pull of the earth's field is just balanced by the upward thrust of the fluid pressure or of the equivalent body force. Let us consider the case of an elongated body symmetrical about a vertical axis through the centre of mass of the body, and let us suppose the earth's field to be also symmetrical about the same axis; there is then no moment tending to turn the body about any horizontal axis. Several terms disappear from the general expression for the earth's field on account of the assumed symmetry, but those remaining represent the component of a force that turns the suspended elongated body about into the prime vertical for a normal field