An Elementary Text-book of Botany. By Sydney H. Vines, M.A., D.Sc., F.R.S. With 397 illustrations. Pp. 611. (London: Swan Sonnenschein and Co., Ltd., 1898.)

PROF. VINES'S "Students' Text-book of Botany," or at least the first half of it, was reviewed in NATURE for October 25, 1894. This book is now widely known, and, as a well-ordered repertory of facts for the advanced student, is probably unrivalled.

The present work, as we are told in the preface, was "undertaken to meet a demand which appeared to exist for a less bulky and expensive volume." While the reduction in cost is considerable, the diminution in bulk is not so very great; the number of pages is about 600, as compared with about 800 in the larger work. The new text-book has also been somewhat simplified, by the omission of "certain difficult and still debatable topics, such as, for instance, the details of nuclear division, or the alternation of generations in the Thallophyta."

The book, however, subject to these omissions and abridgments, is the same, and for the most part verbally the same, as the original work. It is obvious that an elementary text-book, in the sense of a first introduction to the science, cannot be prepared on this principle. Such an introduction requires to be thought out as a whole, from the point of view of the beginner's needs. Prof. Vines's new publication is only to be called elementary relatively to its predecessor. It remains essentially what it was before its abridgment—a book for consultation and reference on the part of those who have already gained some considerable knowledge of the subject. For this purpose we have no doubt that the book, in its new form, will prove of great value to readers who require sound information on all parts of the science, but who do not need quite so much detail as the larger text-book contains.

It should be added that the present work has been brought "up to date," and takes account of the chief advances in the science which have been made since the publication of the "Students' Text-book."

The Principles of Agriculture: a Text-book for Schools and Rural Societies. Edited by L. H. Bailey. Pp. xv + 300. (New York: the Macmillan Company. London: Macmillan and Co., Ltd., 1898.)

THIS is a work written by eight of the professors and teachers of Cornell University. It attempts within the limits of a small volume to give an elementary popular account of the principles of agriculture. The task is made the more difficult as the subject is not limited to the discussion of the conditions necessary for the growth of field crops, but includes fruit culture, and a long section on animal physiology and nutrition. It follows, consequently, that a great deal is left out that we should have expected to find. An attempt is made to reduce the necessary deficiencies of the book by frequently referring the reader to other books treating the subject more fully.

In the earlier part of the volume there is much excellent teaching in vigorous language as to the primary necessity of a good physical condition of the soil. "The farmer should give attention to the texture of his soil before he worries about its richness. The conditions must first be made fit or comfortable for the growing of plants; then the stimulus of special or high feeding may be applied." . . . "By superior tillage you can expand one acre into eight, or by neglectful management eight acres can be reduced to one." . . . "Success in modern agriculture depends more on the size of the farmer than on the size of the farm."

The book includes not a few misstatements, the result, probably, of hasty writing for uncritical readers.

R. W.

LETTERS TO THE EDITOR.

The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.*]

Experiment to Illustrate the Zeeman Effect.

AN interesting dynamical illustration of the Zeeman effect may be made by fixing a gyroscope so that its axis of rotation is the line of suspension of a pendulum bar so suspended as to be capable of vibrating in any plane. When the gyroscope is rotating the plane of vibration of the pendulum rotates with a precessional motion, and when the pendulum is caused to vibrate in a circular path its rate of description of its orbit depends on its direction of rotation round its orbit. The analogy to the Zeeman effect would make the rotation of the gyroscope correspond to the imposed magnetic force and the motion of the pendulum to that of the electrons. The explanation of the motion by the properties of a gyroscope is pretty obvious. It may be a matter for further consideration whether there are analogies between the length of the pendulum and its precession when describing elliptic orbits and the Zeeman effects: the ordinary elliptic precession corresponding to such a phenomenon as the double sodium line.

GEO. FRAS. FITZGERALD.

Trinity College, Dublin, March 24.

The Colour of Sea Water.

AS Mr. Threlfall, in his letter to NATURE of March 16, seems to have fallen into an error regarding the explanation of the colour of sea water, given by me in the paper referred to in his letter, perhaps I may be allowed to make a few remarks on the subject. He says my explanation is based on the principle that sea water is a blue liquid, and that the green tint often seen in sea water is due to the presence of yellow particles. Now, while it is pointed out in the paper referred to that yellow particles will make a blue water appear greenish, yet it is nowhere stated that yellow particles are the exclusive cause of greenness in sea waters. What may have caused Mr. Threlfall to make this overlook, may be the fact that only an abstract of the paper was published, and the different points, therefore, not fully explained. Still, I think there is enough in the abstract to show that greenness in sea water was recognised to be due in some cases to other causes than the one referred to in Mr. Threlfall's letter.

At the beginning of the paper referred to, experiments are described showing that the water of the Mediterranean is a blue transparent medium full of solid floating particles, and that it is "these solid particles that determine the brilliancy, and the selective absorption of the water determines its colour." It is then shown that the colour of the particles will have an influence on the appearance of the water; that if the particles be yellow the blue water will appear green, as any one can observe on looking at the Mediterranean water where it overlies a yellow sand bed. After describing experiments made on the waters in the Italian and Swiss lakes, the paper goes on to the consideration of the experiments made on sea water on the west coast of Scotland, from which I quote the following:—"The water was here found to be much greener than any previously examined. A large quantity of the water was filtered, when it was found that most of the suspended particles were fine grains of sand. From this it is concluded that the greenness of our northern seas is *in part* due to the reflecting particles being yellow, and the reflected light, therefore, deficient in the more refrangible rays. These yellow sand particles not only explain *part of* the greenness of our northern seas, but they also explain their comparative darkness and deadness, the yellow sand particles reflecting so little light. The importance, however, of even these bad reflectors was very evident during the time the observations were being made. It was noticed that the water was much more brilliantly green during and immediately after an inshore wind, and when the filter showed the water to have a good deal of sand in suspension, than after a calm, when many of the particles had settled out. *Some water collected about a mile seaward from Ballantrae was examined in a glass tube 7½ m. long, and was found to be of a blue-green colour.*"