

farmer will derive inspiration, together with a useful fund of information, from this book, which is written with the clearness of exposition and forcible reasoning which are so characteristic of all Dr. Russell's writings. The opportunity of a new edition has been taken to embody in the section on fertilisers and manures the new materials and the new points of view which the difficulties of war-time have introduced into British agriculture, whereby the book equips the student with a comprehensive epitome of the resources now at his disposal. C. C.

Our Bookshelf.

Mathematics for Collegiate Students of Agriculture and General Science. By Prof. A. M. Kenyon and Prof. W. V. Lovitt. Revised edition. Pp. vii + 337. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1918.) Price 10s. 6d. net.

"THIS book is designed as a text in freshman mathematics for students specialising in agriculture, biology, chemistry, and physics in colleges and technical schools" (p. v). Whatever may be the needs of the American student, the book would scarcely be of use in this country. Originality is not expected in a small book designed to be "the entire mathematical equipment of some students" (p. v), but the chapter on statics would surely be much improved if it contained some account of simple machines. The section headed "Mendel's Law" on p. 282 is defective and misleading; witness the following exercises (p. 284): "A farmer buys two different kinds of thoroughbred chickens, but allows them to mix freely. How many different kinds of chickens will he have at the end of (a) the first, (b) the second, (c) the third year of hatching? Ans. (a) 3, (b) 5, (c) 9."

R. A. FISHER.

The Elements of Descriptive Astronomy. By E. O. Tancock. Second edition, revised, with additional matter on practical work for beginners with small instruments. Pp. 158. (Oxford: At the Clarendon Press, 1919.) Price 3s. net.

MR. TANCOCK is the secretary of the committee appointed by the British Astronomical Association for the purpose of encouraging the teaching of astronomy in schools. This book is based on courses of lessons which he gave to junior forms. A large portion of it is descriptive of the aspect and nature of the various orbs, of which excellent photographs and drawings are reproduced. The remainder is devoted to explaining the celestial motions, which is done in a lucid manner. Instructions are given for making a model of the celestial sphere on the surface of a spherical flask that is half filled with some dark fluid. A useful series of questions and exercises is appended, also a set of passages relating to astronomy, selected from English literature, on which explanation or criticism is invited.

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An erratum occurs on p. 55. The time of revolution of Saturn's outer ring should be 13.7 hours, not 137.

Vital Statistics: An Introduction to the Science of Demography. By Prof. George Chandler Whipple. Pp. xii + 517. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1919.) Price 18s. 6d. net.

THIS manual is intended for American public health officials who, in the author's words, have forgotten most of their arithmetic—not to mention algebra. A good deal of space is consequently devoted to the details of tabulation and the making of diagrams. The census and the statistics of births, marriages, and deaths are fully treated. The absence of uniform laws in the different States of the Union, and the mixed character of the population, are sources of many pitfalls for the student. General rates are of little value in dealing with a population of native-born whites, foreign-born whites, and negroes, and the author duly emphasises the need for care in such cases. The more theoretical parts of the book touch on frequency curves, correlation, and the structure of a life table. In the chapter on correlation, a coefficient 0.54 is described as *low*, and cited as an example of the use of the coefficient as "an admirable weapon for exploding false theories." A public health official would need more technical knowledge than is provided in this book to justify him in rejecting a coefficient of this magnitude.

Insect Life on Sewage Filters. By Dr. W. H. Parkinson and H. D. Bell. Pp. viii + 64. (London: Sanitary Publishing Co., Ltd., 1919.) Price 3s. 6d. net.

THE title of this little book is rather misleading. The original matter deals almost entirely with one species of insect, *Achorutes viaticus*, in relation to the efficiency of the sewage filters where it is very frequently found in large numbers. The authors seek to prove that *Achorutes* attack and consume the colloidal matter and fungoid growths which often choke the upper layers of the filters, and in this way enable a larger volume of sewage to be purified than is possible when these insects are not present. Experiments were made with two filters; in one precautions were taken to exclude *Achorutes*; in the other the insects were encouraged to develop. Analyses of the effluents produced by these filters showed that where *Achorutes* was absent the purification effected was less than in the other filter, but when the insects were added to the first filter nitrification improved at once. Although the authors' conclusion seems to be justified, their interesting experiment is scarcely worthy of publication in book form. The biological details appear to be mostly from Haig Johnson's work on the subject.

The Transmutation of Bacteria. By Dr. S. Gurney-Dixon. Pp. xviii + 179. (Cambridge: At the University Press, 1919.) Price 10s. net.

THIS small book deals with certain variations, morphological and physiological, which are