

THE ELEMENTARY PRINCIPLES OF
CROP PRODUCTION.

(1) *A Student's Book on Soils and Manures.* By Dr. E. J. Russell. Pp. ix+206. (Cambridge: At the University Press, 1915.) Price 3s. 6d. net.

(2) *Soils and Plant Life as Related to Agriculture.* By Prof. J. C. Cunningham and W. H. Lancelot. Pp. xx+348. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1915.) Price 5s. net.

(1) IN the past the "Farm Institute" has been very inadequately represented in our system of agricultural education, but of late much has been done to remedy this defect, and, but for the outbreak of war, more would by now have been accomplished. This type of institution is designed to serve primarily the needs of the country youth whose general education is inadequate for the more advanced courses of the universities and agricultural colleges. The common type of "farm institute" student will thus be the youth whose previous education has been restricted to the curriculum of the rural elementary school with, in most cases, an intervening period of practical work on the farm.

It is for such students that the series of textbooks, of which Dr. Russell's volume is the latest issue, is primarily intended, and by the standard of their capabilities it must be judged. It is not clear just in what way Dr. Russell intends his book to be used. In scope and general mode of presentation it may well serve as a pattern for the teacher, but in the hands of the average "farm institute" student we fear that, without considerable assistance from the teacher, much of it will be rather difficult reading. The fault lies probably not so much with Dr. Russell, who has sacrificed nothing in clearness and attractiveness of presentation, as with the limitations of space imposed upon him, which have necessitated a measure of condensation which is undesirable in all elementary textbooks, and in none more so than in those provided for the agricultural student.

For its refreshingly unorthodox and suggestive treatment of a well-worn subject, the book is highly to be commended. An excellent feature is the freedom with which the results of experiments made in this country have been drawn upon for the purposes of exposition. The Rothamsted experiments naturally have been chiefly drawn upon, but the useful work done elsewhere is more adequately represented than in any other textbook. The book is printed in attractive type, is freely illustrated with photographs and diagrams,

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and, apart from one or two obvious slips, leaves nothing to be desired in precision.

(2) In so far as they cover the same ground, the treatment of the subject by Messrs. Cunningham and Lancelot differs widely from that of Dr. Russell. In their "first study in agriculture for rural, grade, and high schools, based upon sound educational principles," they adopt throughout the didactic method which postulates at each stage the approach to knowledge through individual experimental inquiry. The student is led by easy and connected stages through the study of the origin, nature, and functions of the soil, to the study of the outstanding phenomena of plant life, and the application of the knowledge thus gained to the practical problems of crop production.

The numerous exercises in the first half of the book are well designed and practical in their bearing, and are described with a care which must ensure success in the hands of the most inexperienced student. It is left to the student to draw his own conclusions, although by leading questions his attention is directed to the essential information which it is desired that he shall acquire.

The method of treatment is quite conventional, but is so well and carefully worked out that the intelligent student cannot fail to acquire a very useful knowledge of the subject. A word of commendation must be given to the photographic illustrations, which are numerous and uniformly good.

The work is intended for the American student, and the exercises and illustrations are largely such as appeal most directly to him, but students and teachers in this country will find much that is useful and suggestive in it.

OUR BOOKSHELF.

Third Appendix to the Sixth Edition of Dana's System of Mineralogy. By Prof. W. E. Ford. Completing the work to 1915. Pp. xiii+87. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1915.) Price 6s. 6d. net.

THE study of mineralogy has received a new stimulus in recent years from discoveries in radioactivity and in the use of X-rays for the exploration of crystal-structure. Just as the determination of optical principles from large and specially selected specimens laid the foundations of microscopic petrography, so these later physical experiments are bound to provide new methods of mineral analysis. While enlarging in the widest sense the bounds of human knowledge, they will reveal the alliances and differences among minerals that bring a philosophic touch into the dry matter of classification. The third appendix to Dana's "System of Mineralogy," drawn up by