

THURSDAY, MAY 30, 1918.

## GARDENING: OLD AND NEW.

*The Standard Cyclopaedia of Horticulture.* By L. H. Bailey. In six volumes. Vol. v., P-R. Pp. v+2423-3041+plates. Vol. vi., S-Z and Supplement. Pp. v+3043-3639+plates. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1916-17.) Price 25s. net each vol.

THE excellence of Prof. Bailey's "Cyclopaedia of Horticulture," the earlier volumes of which have already been noticed in these pages, is maintained in the fifth and sixth volumes, which have now appeared and arrived safely in this country. We can imagine no more interesting or stimulating reading for British horticulturists than the articles on subjects grown by them and also cultivated in America.

The differences of climate between the States and this country are reflected in the different horticultural treatment practised by European and American experts. Thus, in the case of the strawberry we find that in the southern districts of the United States it is the practice to take one crop only and then to discard the plants, whereas in our more moderate climate growers generally take three crops before ploughing up their plantation.

Again, as is to be expected in the case of so American a genus, the grape-bearing species of *Vitis* are treated of in a far more comprehensive manner than in any British cyclopædia; indeed, we confess to a glad surprise to learn that there are no fewer than thirty-six species of *Vitis* which bear edible grapes.

Here and there the British horticulturist will notice omissions, as, for example, the failure of the author responsible for the article on tulips to cite among the "literature" the admirable monograph of Mr. Dykes on that genus of plants.

The rapidly growing importance of California as a seed-raising country is strikingly illustrated by the statement in the article "Seed and Seedage" that the seeding acreage under lettuce, onion, and sweet-pea—most popular of flowers in America—is no less than 5000. In addition to these seed crops, America contributes large and increasing quantities of seed of the culinary pea, bean, cabbage, radish, and others; nevertheless, the American imports of garden seed alone are of the annual value of two million dollars.

Among the important genera described in these volumes are *Primula*, *Prunus*, *Pyrus*, *Rosa*, and *Solanum*, and each is dealt with in a thorough manner. It is noteworthy that, as admitted in the article on the potato, America, like ourselves, has awakened late to the great importance of this crop; Germany alone of all the great nations seems to have taken advantage of the fact that this plant is the most productive of all cultivated food plants. Whereas half the huge crop raised in Germany is used for food for stock or for commercial purposes, only 1 per cent. of the far smaller crop is similarly employed in America.

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The treatment of *Primula sinensis*—that queen of flowers for glass-house cultivation—is too meagre to satisfy the British florist, and none of the chief varieties—so interesting both scientifically and floristically—is mentioned. Nor do we think that Prof. Bailey would concur in the statement with respect to peas (p. 2490): "Left to themselves, the varieties of peas soon lose their characteristics through variation."

Broadly speaking, however, the information provided in the cyclopædia is accurate and comprehensive, and we advise all British horticulturists to provide themselves with a copy. Once they possess it, it will be in constant use.

## PRINCIPLES AND METHODS OF SCIENCE TEACHING.

*A Text-book in the Principles of Science Teaching.*

By Prof. G. R. Twiss. Pp. xxvi+486. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1917.) Price 7s. 6d. net.

THIS book is a treatise on the principles and methods of science teaching in secondary schools, and is intended to serve as a text-book on education in training colleges and as a guide to all who are concerned with science teaching and its organisation. It is a large book of twenty-four compact chapters, each being a veritable mine of information. At the end of each chapter there are valuable lists of reference books and sets of questions for further study, and in the appendices are given a selected list of science books suitable for school libraries, a bibliography for teachers, and a list of scientific periodicals.

In the earlier chapters are set forth the principles which should underlie all science teaching, the meaning of science, the viewpoint of the science teacher, and the educational value of science in discipline and culture. The rest of the book is devoted to the details of the methods of class-teaching in biology, geography, physics, chemistry, and what is known as "general science," and to an elaboration of the design of classrooms and laboratories, with catalogues of furniture, apparatus, and plant.

In his earlier chapters the author emphasises the principles which he holds should form the basis of science teaching. He tells us truly—and it is a fact which, strangely enough, stands more in need of emphasis to-day than at any other time—that "modern science and modern social and industrial life are inseparably linked together, and that each in turn causes the other to advance." There is nothing new in this principle, but its application to education in schools is being rejected, one after another, by educational boards and Government committees the function of which it is to reconstruct education after the war. In America, apparently, the authorities put their faith in the principle. "The science work of the school," says our author, "must be kept in close touch with the doings of everyday life, and especially with the activities that lie nearest to the immediate interests of the boys and girls." This, we believe, is the true democratic principle of edu-

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