adequate means of co-operation in regard to research on new methods and weapons of warfare and national defence. The war on disease is supremely a task for international co-operation in research, both for treatment and preventive measures. Nor can we neglect to take account of what the United States and other industrial countries are doing to encourage research in industry, if we are to rectify the neglect with which some fields of British industry have been charged in the past, and to attain the industrial efficiency essential for the achievement of our plans and hopes for social security, for full employment and a higher standard of living.

THE RURAL PURSUITS OF PRESIDENT JEFFERSON

Thomas Jefferson's Garden Book, 1766-1824, with
Relevant Extracts from his other Writings

Annotated by Prof. Edwin Morris Betts. (Memoirs of the American Philosophical Society, Vol. 22.) Pp. xv+704+36 plates. (Philadelphia: American Philosophical Society, 1944.) 5 dollars.

TO most gardeners, I suppose, the name Jefferson suggests that most delicious of dessert plums that was raised by Judge Buel of Albany, New York, the year before Jefferson died. This is a fitting memorial to one who in addition to his activities as ambassador, governor, Secretary of State and President, was both an accomplished naturalist and devoted gardener. Barton, the botanist, who named the genus *Jeffersonia* in Thomas Jefferson's honour, stated "In the various departments of science, but especially in Botany and Zoology, the information of this gentleman is equalled by few persons in the United States".

The "Garden Book", which is the subject of the work under review, begins with an entry for March 30, 1766, a record of the flowering of the purple hyacinth, and ends with the year 1823, but during those fifty-seven years the entries vary greatly in number and extent. During Jefferson's considerable absences abroad no entries occur, and in the total the printed transcriptions of the actual diary occupy only about one hundred of the seven hundred of the present work. The rest of the text is made up of extracts from Jefferson's correspondence, garden entries from other of Jefferson's memoranda and numerous notes. The whole comprises an interesting commentary on the gardening and farming of this period and reflects the personality of an observing and exact mind.

Perhaps the most unusual feature, remembering that the garden book was compiled considerably more than a century ago, is the quantitative character of so many of Thomas Jefferson's notes. Thus he tells us that 2,500 of his early peas filled a pint measure. It required one hundred of his strawberries to fill half a pint, whereas to-day less than twenty would probably be required to occupy the same volume. Again we read that it took Julius Shard three minutes to fill a two-wheeled barrow and a minute and a half to take it thirty yards. In the same manner he records the amount of water required for mortar and the quantity of vinegar yielded by his grapes. His calendar of the flowering times and the intervals between planting and maturity are similar expressions of a precise mind that was concerned with the efficiency of the mould board of a

plough at one period and at another was concerned with the average length of the stride of a horse.

It is obvious from a perusal of these pages that Jefferson had a great love of trees and indeed he wrote that "planting trees has always been my passion inasmuch that I rarely planted a flower in my life". Nevertheless, he obviously had an eye for a good herbaceous flower, and the list of plants which he bought from James Lee of Hammersmith when he visited England in 1786 included three specimens of that exquisitely beautiful lily *Lilium canadense*.

Although he was familiar with the renowned gardens near Paris, it was the English school of garden design that aroused his greatest enthusiasm. After his return from England he wrote "the gardening in that country is the article in which it surpasses all the earth".

But if gardening was to this distinguished man of affairs his chief hobby, it was equally true that farming was one of his prime occupations. He clearly recognized what is too often forgotten, that horticulture and agriculture are branches of a common stock that require for their successful development to be nourished from diverse fields of knowledge. Of agriculture he wrote, "it is a science of the very first order and counts among its handmaids the most respectable sciences, such as Chemistry, Natural Philosophy, Mechanics, Mathematics generally, Natural History, Botany".

On his own farm, which covered an area of five thousand acres, more than eleven hundred acres were cultivated and he adopted a seven years rotation with two years of red clover, then crops of vetch and buckwheat, followed by wheat with folded sheep on turnips in the autumn, maize and potatoes, rye and clover. Jefferson evidently believed that the atmosphere was responsible for the restoration of soil fertility, and held that the advantage of manuring is that it will do more in one than the atmosphere would require several years to do. It was his farming activities that led him to devise a mould board that reduced the resistance to ploughing, to experiment with the germination of clover seed on moistened cotton and to determine the value of sowing devices in terms of the amount of seed required which showed that two-thirds of that sown by hand was wasted.

His attempts to introduce rice and olives into South Carolina were but isolated instances, of economic species, among the many endeavours which Jefferson made, often with success, to add to the range of exotic species grown in America.

When we add that he was a pioneer in the development of contour ploughing in the New World and recognized its great value in relation to erosion, it will be obvious that his activities in the rural sciences had a marked influence on their development beyond the limits of his own State. If the pages of this book are something of a patchwork in which the constituent fabrics are of diverse texture and significance, it is equally true that they epitomize the changing fashions and developments of half a century and the colourful occupations of a lifetime. The preparation of the work was made possible by the Penrose Fund of the American Philosophical Society, but it is to the labours of Prof. Edwin Betts that we owe the annotations without which the volume would have lost a great deal of its value, both as shedding light on the preoccupations of a versatile mind and on the horticulture and agriculture of the period.

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