Hawthorns. In the fourth volume of Charles Sprague Sargent's "Silva of North America", published in 1892, there appears an enumeration of the native species of the genus *Crataegus*. The generic name *Crataegus* is derived from the Greek word *kratos*, referring to the hardness and strength of the wood. Commonly the group is known as Hawthorn and is sometimes called Thorn Apple, or Haw. The term Hawthorn appears to be derived from the old form *hage* or *haeg*, a hedge, and *thorn* in allusion to the sharp pointed spines usually characteristic of the genus. "May" has been used very often in English literature for the so-called English Hawthorn. Sargent states that about forty species of *Crataegus* are known, these being about equally divided between the Old World and the New, fourteen species being natives of the United States. In 1902, ten years later, in a supplementary volume (Vol. XIII) Sargent included eighty-four species as coming within the region covered by the Silva, but in his enumeration he did not admit a number of species that are recognized as shrubs rather than trees. At this time he stated that the number of American species was vastly greater than had been previously thought to be the case and that for their recognition and description some later work on American dendrology would have to be prepared.

The Hawthorns comprise a group of trees and shrubs which normally have white flowers and pomaceous or apple-like fruits. The fruits are usually red but may be yellow, purple, black or green when ripe. Although they resemble small crabapples they exhibit a marked botanical difference in the hard bony coverings of the seeds. The petals are five in number except when there is a tendency for the flowers to become double. The stamens are usually five, ten, fifteen or twenty or sometimes twenty-five in number and, with the color of the anthers, are regarded as of specific value in separating closely related species.

Horticulturally and in general garden practice, the Hawthorns may be expected to thrive under the same conditions as apple trees. They have not received the attention they merit as small ornamental flower-
ing trees, or as hedge-plants or for their fruits which are often showy and of value as food for birds and sometimes also for man.

The so-called English Hawthorns of our gardens are usually classed under the botanical name of *Crataegus Oxyacantha* but there is another species, *Crataegus monogyna*, which closely resembles it and is often confused with it. The fact that they have hybridized adds to the confusion. Besides some differences in the leaves, the two species are differentiated by *C. Oxyacantha* having usually two of the hard bony nutlets or seeds in the fruit while there is only one in *C. monogyna*. The latter becomes a larger tree, attaining a height of over thirty feet. These white flowered trees are still occasionally seen in our gardens but they are considered less desirable than some of the garden forms which have been derived from the types. They apparently have a greater tendency to produce colored flowers than has been shown by any of our native American species, although by long cultivation and selection we may develop from these many interesting garden forms. Of the European forms in cultivation *Crataegus Oxyacantha plena*, or *multiflora*, with very small rosette-like or double white blossoms, is one of the best of its kind. Among those with colored flowers Paul's Double Scarlet takes first rank for its brilliant scarlet blooms. It is the most conspicuous of the Thorns in brilliance of color. These various garden forms must be grafted or budded as the plants cannot be grown from cuttings.

There are other foreign species of *Crataegus* found in our parks and gardens but they are generally considered rare or uncommon. Among them *Crataegus pinnatifida*, from northeastern Asia, is one of the most interesting. This becomes a small tree twenty feet in height, with large deeply or pinnately lobed, lustrous leaves, large flowers and large dark red fruits. A horticultural form, *C. pinnatifida major*, from northern China, is cultivated by the Chinese as an orchard tree for its edible fruits which are sometimes an inch in diameter.

The collection of Hawthorns in the Arnold Arboretum is mainly located on the slopes of Peters Hill and, so far as possible, the chief groups have a frontage on the main driveway. With the possible exception of the collections in the parks of Rochester, New York, the Arboretum contains the largest collection of American species in cultivation. Students may find plants of various species in flower during a period of five or six weeks.

The first species to show open flowers is *Crataegus Arnoldiana*. It was originally found growing naturally on the grounds of the Arnold Arboretum and although afterwards discovered in a few other places it appears rare in a natural state. It was named by Professor Sargent for James Arnold who by his will gave the original fund which made the Arboretum possible. This season the first flowers were found open on May 12th, these being about three-quarters of an inch in diameter and provided with ten stamens with yellow anthers. The trees become twenty or twenty-five feet in height, having stout trunks and broad rounded tops. The fruits are bright crimson, sometimes nearly three-
Crataegus Arnoldiana. 1, flowering branch; 2, section of flower; 3, calyx-lobe; 4, fruiting branch; 5, section of fruit; 6, nutlet. All reduced.

From drawings by C. E. Faxon for Sargent’s “Silva of North America”.
quarters of an inch in diameter and mature about the middle of August, usually falling before the first of September. They have a pleasant sub-acid flavor. The fruits of some species, as *Crataegus submollis*, bright red or orange-red in color, are often gathered and made into preserves or an excellent jelly, either pure or in combination with some other fruit, such as crabapples.

In another group we have *Crataegus coccinioides*, a broad-spreading, low, round-topped tree producing large flowers, about three-quarters of an inch across, and globose dark crimson fruits with thick red flesh which should make excellent preserves. Its foliage, which is tinged red when unfolding, turns orange and scarlet in the autumn. The Hawthorns already mentioned are less known to the general public than the Cockspur Thorn (*Crataegus crus-galli*) which represents an interesting series of species extending from the Province of Quebec, near Montreal, southward to Florida. There is often confusion among nurserymen with regard to the species as at present known and apparent and unintentional substitution sometimes occurs. What is accepted as true *C. crus-galli* is a species with late flowers, having ten stamens with rose-colored or purple anthers; the leaves are lustrous, narrowly oblong-ovate tapering to a cuneate short-stalked base, usually rounded at the apex, sharply serrate and rarely lobed. The fruit is red and persists late. The species may become a tree thirty or thirty-five feet high but it is often low and broad-spreading. It is an interesting and useful tree either grown singly or as a strong barrier hedge, for which it is well adapted.

Some interesting supposed hybrids have been developed from this species or its allies, but they are as yet little known in this country. Among these may be mentioned *Crataegus Lavallei* having leaves which turn brony-red late in autumn and fruits which remain on the trees through the winter, and *C. persistens* which holds its foliage in a green condition until early winter and with it bears its conspicuous and persistent red fruit.

*Crataegus punctata*, the Dotted Thorn, is a representative of another group which grows naturally in eastern North America from Canada to Illinois and Georgia. While a low tree twenty or more feet in height its branches may spread over an area forty or more feet in diameter. It is well worth planting in parks or where there is plenty of room for the development of its normal beauty. It is rather late in flowering but blossoms before the Cockspur Thorn.

The latest of the Thorns to bloom is the Washington Thorn (*Crataegus phaenopyrum*, or *C. co data*), which becomes a small erect tree with rounded top. It bears small flowers in many flowered corymbs, small scarlet fruit which persists through the winter, if not earlier eaten by birds, and handsome clean foliage which turns scarlet and orange in the autumn.

The thorns mentioned are among those best known in general planting. The collections in the Arboretum must be studied to get a fair idea of the diversity and richness of our hawthorn flora.

J. G. Jack