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Hawthorns. The genus *Crataegus* is widely distributed through the northern hemisphere, being found in the three northern continents. In Europe it extends with a few species from the Atlantic coast into western Asia; it is rare but widely distributed with not more than six species in eastern Asia, with two in Japan, and in North America is found its greatest number of forms and widest distribution.

American Hawthorns. In 1894, when the fourth volume of Sargent's "Silva of North America" was published, fourteen species of *Crataegus* were recognized, one of these being a small shrub. Five years later a more systematic study of the genus in this country was undertaken, and more than a thousand species with several varieties have now been described. In North America Hawthorns are distributed from Newfoundland and northern Quebec to northern Florida and northern Mexico, and from the Atlantic to the Pacific. The genus is much more abundant in species east of the eastern borders of the great plains than in the Rocky Mountain and Pacific regions where they range northward into British Columbia and southward into northern California. So far as is now known the species are most abundant in the valleys of the streams which flow from the north and south into Lake Erie, and in the region which extends from southern Missouri to the valley of the Red River in Arkansas. New York and Pennsylvania are rich in species, and southward along the Appalachian Mountains, and in the southeastern states the species are not rare. They have now been arranged in twenty-two groups distinguished by the shape and character of the leaves, the size of the flowers and the size and shape of

the fruit. It is interesting that while some species of these groups are widely and generally distributed those of others are chiefly confined to particular sections of the country, as the *Flavae* to the southeastern states, the *Douglasianae* to the northwest, and the *Tenuifoliae* to the middle and northeastern states. The *Macracanthae*, which is one of the common northern groups with many large trees, is extremely rare in the southern states and in Arkansas and eastern Texas is represented by only a few small shrubs. The *Intricatae*, composed mostly of small shrubs, has its greatest number of species in Pennsylvania and adjacent states but is extremely rare in the Mississippi valley and westward is unknown. The characters and history of this Group are interesting. It is distinguished by leaves usually cuneate at the base, large flowers in few-flowered clusters with ten or twenty stamens, and yellow, rose-colored or red anthers with conspicuously glandular bracts and bractlets and subglobose, short-oblong or pear-shaped, red, orange, greenish or bright yellow fruit. A few Appalachian trees are now placed in this Group but the rest are small shrubs. This is one of the largest groups with no less than eighty-two species; thirty-two of these have been recognized in Pennsylvania and seven in New York. The Group is represented in western New England and in Michigan by several species, and only a few species have been found in the Missouri-Arkansas region. Birmingham, Alabama, is the most southern station where a member of this Group has been found. In spite of their abundance and well-marked characters these plants were entirely overlooked by the older American botanists who did not preserve specimens of any of the species in their herbaria, and it was not until 1894 that a Dane described the first species, *C. intricata*, from a plant cultivated in the Copenhagen Botanic Garden. The small size of the plants, their large and handsome flowers and conspicuous fruits make these little Thorns valuable garden plants. The *C. Macracanthae*, of which *C. tomentosa* of Linnaeus is the type is an interesting group because it differs from all the other forms of *Crataegus* in the deep pit on each side of the inner surface of the seeds. They are all large and handsome trees. The species in the different groups are chiefly distinguished by the number of stamens, which varies from twenty to twenty-five, and the color of the anthers which is red in some species and yellow or nearly white in others, in the shape of the leaves, the time of flowering, the size, color and shape of the fruit which is usually red but occasionally yellow or orange color. In a well known species, *C. punctata*, the anthers and the fruit are red, but in one form the anthers and the fruit are yellow. This is the only species in which such variation has been noticed. There are now probably about five hundred American species growing in the Arboretum and it is of course impossible to call attention to all of them in one of these Bulletins. They can all be seen on the eastern slope of Peter's Hill as well as in other parts of the Arboretum, and species will be blooming here for at least two months more. *Crataegus arnoldiana* is the first species to flower in the spring and the flowers are already fading. This tree was discovered growing naturally in the Arboretum; it grows also on the banks of the Mystic River in Medford, Massachusetts, and near New London, Connecticut. It belongs to the Molles Group which are trees of which a number of species have been distinguished by their large size, large

early flowers which usually open before the unfolding of the leaves, and by the large, often edible, red or rarely yellow fruits. The species are found from the valley of the St. Lawrence River in the Province of Quebec to Texas but are most numerous in the region west of the Mississippi River, and are almost entirely wanting in the southeastern states. They all have large handsome fruit and that of *C. arnoldiana* ripens in August while that of some of the other species remains on the branches until late in the autumn. The two species of western Europe, *Crataegus oxycantha* and *C. monogyna*, and many of their varieties, are established in the Arboretum. These are the only foreign species ever naturalized in North America where they are now abundant in some parts of Nova Scotia. Forms of these species occur with red and with pink flowers and with double flowers.

Early Roses. Four species of Asiatic Roses have been the first to flower in the Arboretum this year, *Rosa Ecae*, *R. Hugonis*, *R. omeiensis* and *R. koreana*. *R. Ecae*, still rare in gardens, a native of Afghanistan and Turkestan, is a tall, perfectly hardy, fast-growing shrub with pale yellow flowers about an inch in diameter; they are paler in color and slightly smaller than those of *R. Hugonis*, but it is a more vigorous and satisfactory plant and the fragrance of the leaves adds to its value. It has never before been as full of flowers as it is this year, and this week it is one of the handsomest plants in the Arboretum. *R. omeiensis*, which is common on the mountains of western China and is named for Mt. Omei, one of the sacred mountains of the Empire, is a hardy, fast-growing shrub with erect stems covered with prickles. In its native country this Rose sometimes grows to the height of twenty-five feet and a good hedge might be made with it for New England gardens. *R. koreana* is flowering this year only for the second time in cultivation and it is a perfectly hardy little plant with white flowers not more than the size of a ten-cent piece. The handsomest of the so-called Scotch Roses (*Rosa spinosissima*), the variety *altaica*, with petals fringed with yellow toward the base, is just beginning to open its flower-buds. Like the other forms of *S. spinosissima* it has stems covered with prickles, rather small leaves and comparatively large black shining fruits.

Early Flowering Rhododendrons. One of the best Rhododendrons for New England is *Rhododendron carolinianum*, a native of high altitudes among the Appalachian Mountains of North Carolina. It is a low, compact shrub with pale rosy purple flowers. First described as a species in 1912 by Rehder (*Rhodora* xiv. 97), it has only recently become common in American gardens through the agency of the Kelsey nursery. It was introduced, however, into England more than a century ago, as a figure of it was published in 1915 in the *Botanical Register* as a variety of *R. punctatum*. There are small plants of a white-flowered variety of *R. carolinianum* in the Arboretum collection. *R. caucasicum* is unfortunately not in the Arboretum except in the form of small seedlings, but some of its varieties are hardy and beautiful plants of dense habit with dark green leaves and handsome and usually abundant white flowers slightly tinged with pink or rose color. There is much confusion in regard to the history of these plants and their



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