The Black or Berry-Bearing Alder for Gunpowder. (Rhamnus frangula, L.)
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height and is 3 ft. 9 in. in girth. In many respects this is the best of all times. Its branches are rather pendulous and its dark green leaves are remarkably glossy and clean looking. *Cercidiphyllum japonicum*, usually rather disappointing in this country, is 25 ft. high at Tortworth, and thriving. *Cornus controversa* (commonly but erroneously named *C. brachypoda* in gardens) is 20 ft. high, very distinct in its horizontal branching. Of *Acanthopanax ricinifolium*, a remarkable araliad becoming 80 ft. or more high in North Japan, but of which few plants have succeeded for any length of time in England, Lord Ducie has a promising young tree 25 to 30 ft. high, its trunk girthing 23 in. breast high, 3 ft. 1 in. at the base. *Maclura aurantiaca*, the Osage orange, is generally considered to be dioecious, but a tree at Tortworth—the only one there—has borne fruit. *Magnolia acuminata*, the so-called cucumber tree of North America, is represented by a very elegant tree 50 ft. high. Another interesting American tree, the tupelo (*Nyssa sylvatica*), is thriving well with the boggy condition at the root which it affects in its native country. This tree is worth growing for its autumn colour. In the park is probably the best example in Britain of the blue ash (*Fraxinus quadrangulata*) so distinct in its square four-angled stems. Ten years ago this tree was 34 ft. high and 1 ft. 10 in. in girth of trunk. Now it is about 40 ft. high and 2 ft. 8 in. in girth.

For the thorough study of the Arboretum at Tortworth several full days would be needed. The notes on which this paper is based were hurriedly taken during a visit of a few hours on May 28th, 1915. The girths given are correct, but the heights are approximate, there being no time to use a dendrometer. But I tried to avoid the usual fault of exaggerating the stature of the trees.

To conclude, a few words must be given to the celebrated Tortworth chestnut (*Castanea sativa*) now a ruin, but a magnificent and by no means a lifeless one. It stands near the site of old Tortworth Court and the Church. Owing to the rugged and uneven character of its trunk it was not easy to measure accurately, but I made the narrowest girth 51 1/2 ft., equal to about 53 1/2 yards in average diameter. According to legend, King John held council under it, and even in King Stephen’s reign Evelyn says it was known as the Great Chestnut of Tortworth. Little is left now but the remains of its gigantic bole, the upper part of which bears a thin furnishing of leaf-bearing branches, and occasional fruits.

**XXIX.—THE BLACK OR BERRY-BEARING ALDER FOR GUNPOWDER.**

(Rhamnus Frangula, L.)

W. DALLIMORE.

A good many complaints have been made during recent years regarding the poor prices obtained for coppice wood and the difficulty experienced in finding a market for some kinds, yet there are certain coppice woods that are not produced in sufficient quantity to supply the demand, and adequate steps do not appear
to have been taken to replace plantations of unremunerative trees by more promising species.

*Rhamnus Frangula* is a case in point, for, although wild in the southern parts of the British Isles and at one time cultivated to some extent, it has been impossible for many years to secure the required quantity of wood in this country, and importations have been made from Belgium and Germany. The value of the wood at the present time will be appreciated from the fact that when carbonized, the charcoal is recognised as one of the most important of all charcoals used in the manufacture of explosives, its inflammable character making it peculiarly useful as an ingredient for smokeless powder.

Even before the commencement of the present war, manufacturers experienced a difficulty in securing the necessary amount of wood; therefore, there appears to be good reason for landowners in this country, and particularly in the home counties, laying down plantations to replace coppice, which at present hardly pays working expenses.

Under normal conditions *R. Frangula* is found as a bush 6 to 15 feet high with upright branches, or sometimes as a small tree 20 feet high, with a trunk 6 to 9 inches in diameter. The leaves are deciduous, bright green, oval, and 2 to 3 inches long by 1 to 1½ inches wide. The flowers are greenish-yellow and borne in May, and they are followed by small, round fruits, which are alternately red and black when ripening.

Tall, straight shoots with few side branches are most approved for charcoal, and such shoots may be from ½ an inch to 2 inches in diameter; larger wood can be used, but it is usually passed over in favour of the smaller sizes. The wood is either cut in spring when the sap is flowing freely, or in winter when at rest. In the former case the bark is peeled off at once as is done with spring-cut willows, but in the other instance the wood is boiled or steamed before peeling. Great care is taken to keep the newly-peeled wood free from dirt, and provision is made so that it does not come in contact with the ground, for any foreign matter has to be thoroughly cleaned away before the wood can be used. The wood is usually sold to the powder factories as soon as it is peeled, and in normal times the purchasers keep it for a period varying from one to three years before turning it into charcoal. To keep it clean during the process of seasoning it is often stacked and thatched, in the same way as hay or corn, as soon as it arrives at the factories. The exclusion of particles of sand and grit from the charcoal is of vital importance; therefore, after being thoroughly cleaned, the wood is placed in a closed cylinder for carbonization, heat being applied from outside. It is difficult to say what the wood is worth at the present moment, but a few years ago it was quoted at from £10 to £14 a ton.

The most suitable soil for *R. Frangula* is a moderately good loam, but as a rule it may be expected to thrive where the hazel grows well. Propagation should be conducted by means of seeds sown in boxes in a cold frame or in beds of well-drained soil out-of-doors. The young plants should be placed 6 inches apart in nursery rows 1 foot apart, and, when about 9 inches high, they
should be cut back to induce several branches to appear from near the ground line. When the young plants are from 12 to 18 inches high place them in permanent positions at intervals of from 4 to 5 feet, on ground that has been well broken up. From six to eight years rotation will probably be found most suitable for the crop, though position and soil may make a year or two difference either way. An open position exposed to south or west is considered to be most favourable. When cutting a plantation over, care should be taken to cut the branches as close as possible to the root stock; otherwise long, objectionable spurs will be formed. In the event of a large number of shoots being produced from cut-over plants, it is wise to remove all unnecessary ones during the first year. Growth is facilitated by keeping the ground free from coarse weeds and by working between the plants occasionally with a cultivator whilst they are small. Should signs of deterioration appear in the vigour of the branches, a dressing of bone or some other manure may be applied to the land, for a little money spent in this way will be amply repaid by increased yield.

It is doubtful whether a large stock of plants could be procured in the British Isles at the present time, and the catalogue price for single plants places the few which are available outside the bounds of practical forestry; it would therefore appear likely that anyone wishing to undertake the cultivation of this plant would need to commence by sowing seeds. The fruits may be collected during August or September and placed in sand to separate the seeds from the flesh, sowing the seeds and sand together during the early spring. People who already possess large or small plantations might find the present time an excellent one for marketing the produce.

In some parts of the country R. Frangula is known as dogwood, but it is quite distinct from the true dogwood, Cornus, which makes an inferior charcoal, and the two plants must not be confused.

XXX.—MISCELLANEOUS NOTES.

Mr. M. T. Dawe, F.L.S., formerly a member of the gardening staff of the Royal Botanic Gardens, and lately Director of Agriculture, Portuguese East Africa, has been appointed, on the recommendation of Kew, Agricultural Adviser to the Government of Colombia.

MRS. Badderley.—We record with sincere regret the death of Mrs. Badderley, caretaker of the North Gallery, on June 26th, at the age of 67. Mrs. Badderley acted as caretaker of the Gallery from the day it was opened to the public in June, 1882, until the end of last March, when failing health compelled her retirement. During the period of nearly 33 years' faithful service she had won the affection of all with whom she had been associated in the Royal Botanic Gardens.