Ashes. The three trees of *Fraxinus syriaca*, often cultivated as *F. sogdiana*, which have been uninjured in the Arboretum for thirty-eight years and have frequently flowered and ripened their fruit here, were killed to the ground but have now sent up a few feeble shoots from the roots. The flowering Ash so called, (*Fraxinus Ornus*) of southeastern Europe, which has suffered before in the Arboretum but flowered here in the spring of 1917, is now represented by a few weak stump shoots which did not appear until September. *Fraxinus Paxiana*, one of the new introductions from western China, was killed in the Ash collection, but was not injured in the Peter's Hill Nursery.

The Liquidambar and other trees. The North American Liquidambar opened its leaf-buds so late that by the middle of May the trees looked as if they were hopelessly injured. Later they entirely recovered, and in October the leaves of this beautiful tree have not before been more brilliantly colored here. A single plant of the Chinese *Liquidambar formosana* is still living in the Peter's Hill Nursery; it is, however, only a bush for it is more or less injured every winter, and it is probable that this tree will never flourish in the United States except in some of the Gulf and Pacific coast states. *Catalpa Bungei* has not suffered before in the Arboretum but many branches on all the trees were killed by the winter, and one of the two specimens in the Catalpa collection on the hill above the Lilacs was killed to the ground but has now sent up a number of shoots from the roots. The condition of the three Persimmon trees (*Diospyros virginiana*) in the group on the right-hand side near the lower end of the Bussey Hill Road illustrates the fact that some individuals of a species can resist cold better than other individuals of the same species. These three trees were of the same origin and the same age; two are uninjured and the third is now represented by a few weak suckers from the roots.

Various shrubs injured by the winter. Although it was believed in May that the Arboretum had lost a number of species by the excessive cold of the winter, the actual loss has not been as serious as it then appeared. All the plants, however, of the Japanese *Ilex crenata* were killed. These plants have been growing in the Arboretum for twenty-five years and had never suffered in earlier winters more than the loss of a few leaves. This Holly was believed therefore to be one of the few broad-leaved evergreens which could be safely used in northern gardens. Plants of the Inkberry (*Ilex glabra*), a common Atlantic and Gulf coast shrub from New Hampshire to Texas and one of the handsomest and hardiest of the broad-leaved evergreen shrubs which can be grown here, lost for the first time in the Arboretum a large part of their leaves and a few branches during the winter. The plants soon recovered, however, and are now as thickly clothed with leaves as they were a year ago. The largest plants of *Ilex opaca*, another native of the Massachusetts coast region, were killed outright, but smaller plants, although they lost most of their leaves, are still alive. One of the new Chinese species of Magnolia (*M. Wilsonii*), *Daphne genkwa* and *Lonicera Delavayi* appear to be the only species of recent introduction which have been actually killed. All the plants of *Sophora viciifolia* appeared to be dead until June when the leaves began to unfold. None

of the plants flowered but they are all in good condition. All the plants of the new Chinese genus of the Witch Hazel Family (*Sinowilsonii*) appeared to be uninjured in May but many of the branches died after the leaves were fully grown, and although these plants may recover their present condition is not satisfactory.

Evergreen Barberries. It is a satisfaction to be able to report that the four species of evergreen Barberries from western China in the collection, *Berberis Julianae*, *B. Sargentiana*, *B. Gagnepainii* and *B. verruculosa*, are now in good condition, although the leaves of all but the last species were killed and many of those of *B. verruculosa* were injured. It may be expected therefore that these beautiful plants may continue to live in eastern Massachusetts if suitable positions can be found for them.

Corylopsis. The two species of western China which were covered with flowers in the spring of 1917, *C. Willmottiae* and *C. Veitchiana*, were killed to the ground by the cold of the winter and are now represented by feeble stump-shoots, and it is doubtful if these plants can be successfully and permanently grown in this climate. The Japanese *C. pauciflora* and *C. spicata*, which lost their flower-buds and some branches have not looked well through the summer but are recovering. Another Japanese species, *C. Gotoana*, which was uninjured in bud and leaf, seems destined to become a popular garden plant in the northern states.

Several other shrubs which were injured by the winter and in May and June gave little promise of recovery, are now alive and will probably entirely recover. Among them is a plant of the Japanese *Lindera obtusiloba* which, although it has been growing in the Arboretum for twenty-five years, is still one of the rarest plants in the collection as it has not borne seeds and has proved difficult to propagate. This plant is most beautiful in the autumn when the leaves during the first week in November are the color of gold. Another Japanese Benzoin, *B. sericea*, which was injured by the winter will probably recover, although this plant has suffered in less severe winters and will probably never be valuable in this climate. The two *Dipeltas*, a Chinese genus related to *Weigela*, which were killed to the ground have produced shoots from the roots. These plants, although they have flowered sparingly in the Arboretum, have suffered from cold before and it is doubtful if they can be successfully grown in Massachusetts. *Rhus Potaninii*, *Cornus paucinervis*, *Salix Bockii*, *Osmaronia cerasiformis* and *Ceanothus Wrightii* have recovered, as was predicted in the Bulletin issued on the 16th of May. The most important of these for the garden is *Cornus paucinervis* for it flowers here late in July when comparatively few shrubs are in bloom. It is a narrow shrub with numerous upright stems five or six feet high, small narrow pointed leaves with only two or three pairs of veins, small flat clusters of white flowers and small black shining fruits. If this plant proves as hardy in eastern Massachusetts as it has at Rochester, New York, it will be one of the most valuable of Wilson's introductions from western China. *Coluteas* bloom on the branches of the year and all the species, although they had been killed

1918. "Various shrubs injured by the winter." *Bulletin of popular information - Arnold Arboretum, Harvard University* 4(16), 62-63.

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